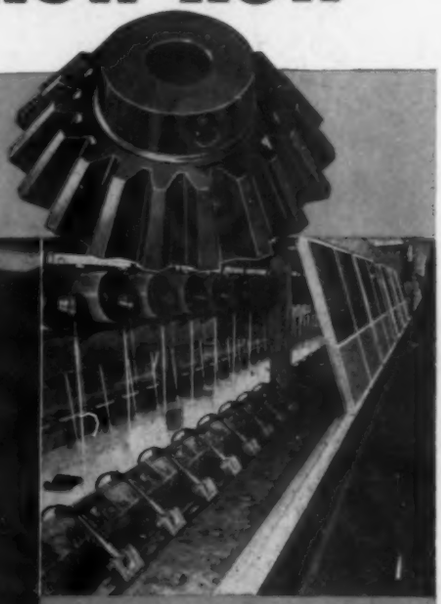
MODERN PLASTICS

AUGUST 1949

It pays to use your custom molder's know-how

say Industrial Rayon Corp. engineers

No. 8 in a series on Plastics Skill at Work . . .



IN THE REVOLUTIONARY DEVELOPMENT that made it possible to spin and process rayon continuously, Durez bevel gears drive reels that advance thread through eight treatments in spinning room.

CHEMICAL INERTNESS, HARDNESS, GLOSSY FINISH are among reasons why the molder prefers Durez phenolic for gears, reels, and other parts.

EXTREMELY CLOSE TOLERANCES must be met, so each molded Durez bevel drive gear is checked on Gleason angular tester before shipment. Skill in mold-making explains why gears run true and duplicate exactly the tooth form and pitch of the laminated gear previously used.

● One of the trickiest problems in the history of plastics, this 3-inch Durez bevel gear shows how completely manufacturers can rely on the know-how of good custom molders.

General Industries had already molded many thread advancing reels for Industrial Rayon's rayon-spinning process, using the Durez phenolic plastic with the ideal group of properties for this service. Then it was suggested that the benefits of plastic could be further utilized . . . in the bevel gear that forms a part of the reel drive assemblies.

Here was the difficult task of producing with micrometer accuracy, first a hobbed model with generated teeth, then the hardened steel mold itself, allowing for calculated shrinkage of the plastic gear in the mold and in cooling. Not only was this done successfully, but the Durez gears were turned out under conditions so well controlled that rejects are few and far between.

Customer benefits? First, impressive economy. The Durez parts need but a single tapping operation, while the laminated ones required hobbing plus a machined metal insert. Other Durez advantages are chemical inertness, vital in the presence of corrosive solutions used in rayon spinning, also smooth natural finish, and impact strength.

For best results, call in your molder early in your plans, and call freely on the experience of Durez field experts.

A new bit with plastics users everywhere is the handy "Durez Check-Chart." Write for yours. Durez Plastics & Chemicals, Inc., 128 Walck Rd., N. Tonawanda, N. Y.

DUREZ

PHENOLIC RESINS

- MOLDING COMPOUNDS
- INDUSTRIAL RESINS
- PROTECTIVE COATING RESINS

PHENOLIC PLASTICS THAT FIT THE JOB

TECHNOLOGY DEPARTMENT

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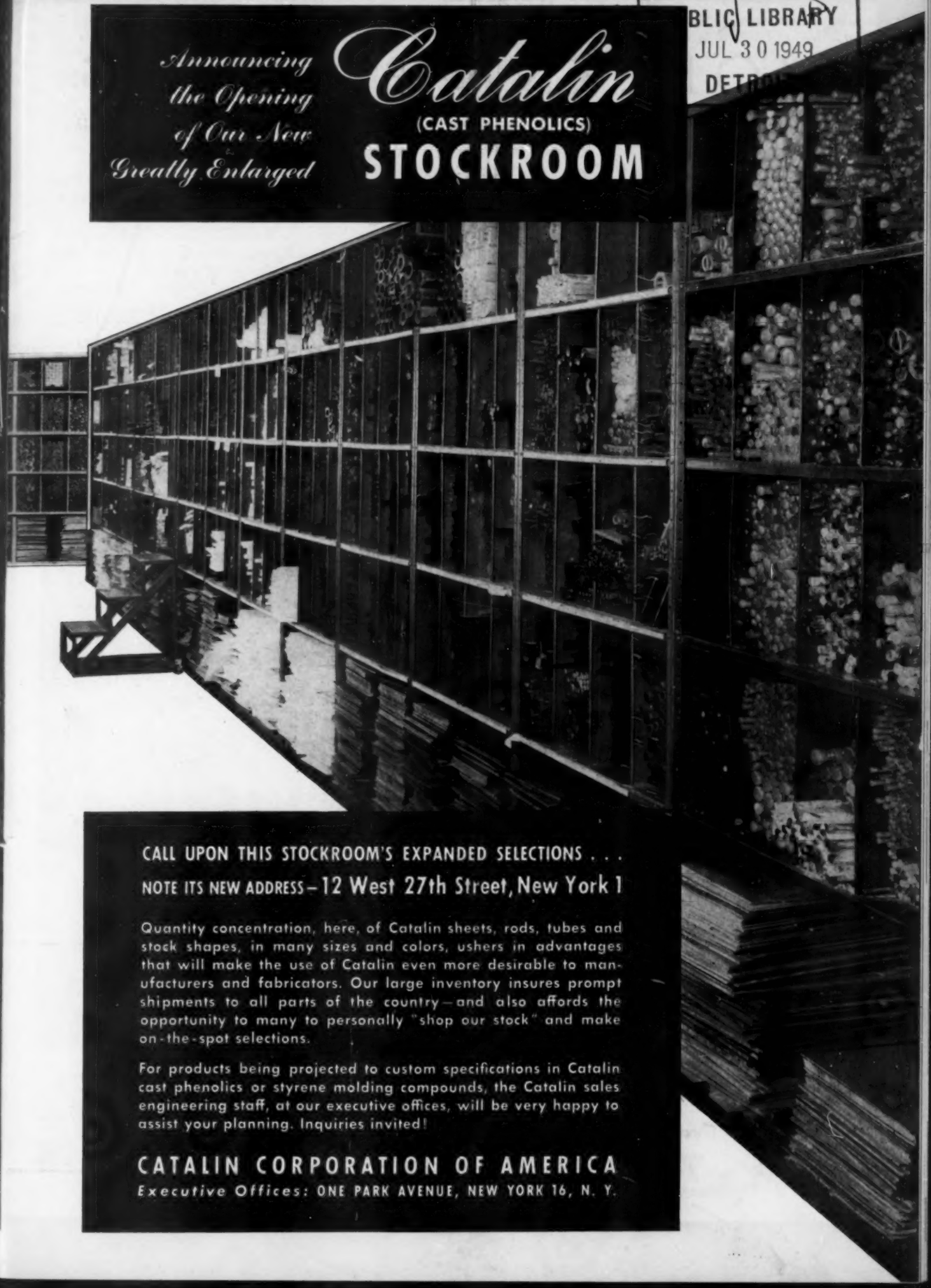
Catalin

(CAST PHENOLICS)

STOCKROOM



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Quantity concentration, here, of Catalin sheets, rods, tubes and stock shapes, in many sizes and colors, ushers in advantages that will make the use of Catalin even more desirable to manufacturers and fabricators. Our large inventory insures prompt shipments to all parts of the country – and also affords the opportunity to many to personally "shop our stock" and make on-the-spot selections.

For products being projected to custom specifications in Catalin cast phenolics or styrene molding compounds, the Catalin sales engineering staff, at our executive offices, will be very happy to assist your planning. Inquiries invited!

CATALIN CORPORATION OF AMERICA

Executive Offices: ONE PARK AVENUE, NEW YORK 16, N. Y.

MODERN PLASTICS*

VOLUME 26 AUGUST 1949 NUMBER 12

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*Reg. U. S. Patent Office.

Portable waterworks

THAT'S "Scotch" WITH THE DOLLARS!

... Another example of what GEON polyvinyl materials can do

WHEN an orchard grows on a slope, or if the ground is gravelly, irrigation is tough, and costly too.

The irrigation hose you see here cuts costs dramatically because it's made of Geon resin, the polyvinyl material with so many advantages.

For example, the mirror-like interior finish of this hose cuts friction loss of the water flow. This permits using much less footage of costly, underground steel supply pipe. Six to eight sprinklers can be used per line—compared to three or four with ordinary hose.

Those are just a few of the advantages of this Geon-made irrigation hose. It is one-third to one-half lighter in weight than ordinary hose of comparable size. No kinks—ever. Sunlight will not break it down. Its brilliant color makes it easy to see.

This hose gets its remarkable qualities from Geon—the versatile material that makes wear-resistant upholstery, tough wire insulation, durable and beautiful flooring and, of course, garden hose.

These uses may start you thinking how Geon can improve your product —or perfect a new one. Geon materials can be extruded, calendered into film or used as a coating. Products of Geon can be made resistant to heat, cold, water, oil, aging and other damaging factors. Brilliant or delicate colors are easy to get.

We make no finished products from Geon polyvinyl materials. But we're ready to help you with your applications. For information or technical service, please write Dept. N-8, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

Resinite Super-Hose made by Resin Industries, Santa Barbara, California, as used at the T. C. Abbott Canyon Ranch, Carpinteria, California.

B. F. Goodrich Chemical Company

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GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

Chicago Molded Plastics — of course!

Enoz, famous for insecticides since 1900, introduces the Slenderized Para Pack. It's Chicago Molded Plastics, of course... beautifully designed and smartly styled in a handsome ivory material. It holds two cakes of moth-killing paradichlorobenzine and, suspended by its own plastic hook, requires no extra closet space. The open mesh grille provides maximum evaporation area and, since no metal is used, there is no danger of rust or corrosion.

Combining all these advantages with the economies of mass production is a job that only molded plastics could do.

• • • •

All three parts of the Enoz Slenderized Para Pack were injection molded of a cellulose acetate material. Other materials and other molding methods might have been used... but not with the same highly satisfactory results.

As usual, the job was approached with an open mind. With complete facilities for compression, injection and plunger molding... with a thorough knowledge of materials and of their characteristics and behaviour ... Chicago Molded was able to make unbiased recommendations... to select the material and molding method best suited to the specific requirements... and to produce the finished parts most efficiently and economically.

This is only possible, of course, in an organization where every needed facility is available... where years of experience in plastics form a background for sound judgment... and where the highest standards of engineering ability and skilled craftsmanship are maintained.

You'll find Chicago Molded meets these requirements in every way. And that's why you'll find this a good place to do business. So... whether you're merely making plans or are ready for quotations, we suggest you talk things over with a Chicago Molded engineer. Write, phone or wire. There's no obligation.

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EDITORIAL

Battling for Markets

As soon as a new product reaches the market in sufficient volume to become a challenge to an old established item that has been cock-of-the-walk for lo! these many years, the fun begins. No cock-of-the-walk, regardless of age, likes to see the arrival of a new and sprightly rival on the scene. And, if the challenge is really serious, the old-timer won't hesitate to use his spurs.

In like vein, several new and successful plastic products have been receiving a pummeling from competitors who are not too happy to see their premises invaded by a dashing new arrival. As examples:

An anonymous packaging engineer was quoted as advising the industry to go slow in the use of flexible plastic bottles. *Hah!* Another man suggested that plastic sewing boxes should give way to metal. *Hah! Hah!!* Still others bemoan plastic seat covers for motor cars. *Hah! Hah!* . . . and *Hah!!!*

But the manufacture of plastic bottles goes on apace with an ever-increasing number of users. Sewing boxes in plastic are now staple items on the counters of nearly all variety stores. Plastic seat covers are being sold in even greater quantity than a year ago.

And now comes another attack on plastics. Producers of chinaware assert that melamine dishes are only a substitute for china. A published report says that they scratch; absorb water; have greasy surfaces; stain.

Dear oh dear! Scratches? . . . Who has never sipped coffee from a cracked or chipped china cup? As to water absorption: laboratory tests, taking specific gravity into consideration, show almost an equal absorption for melamine and vitreous chinaware. Isn't it sad to know that in an inoculum solution, the deposit of B. subtilis spores on another material increased at a greater rate than on plastic? And how horrifying it must be to scores of institutional and restaurant users to find that melamine ware outlasts their former dishware by a big percentage! Admittedly, plastic cups show coffee stains, but so do china cups. Now detergent manufacturers have produced a new solution that removes the stain from plastics just as "china rinse" removes it from china. Inconsiderate of them, isn't it?

There was a most significant statement made by a prominent merchandiser at the recent S.P.I. meeting in Chicago. He said that the minute a new product reaches a stage where it begins to put others on the shelf, the producer of that product will have to double or triple his marketing skill. How to do it depends upon the ingenuity of the merchandiser, but one thing he can count upon for sure: competitors who use other materials will produce a never-ending cacophony of sound that will at least serve to let the merchandiser know that his product is making an impression on the field.

INSUROK
By
RICHARDSON

DEPENDABLE NAMES IN PLASTICS

A RECORD OF SERVICE—The Richardson Company is proud of the contribution Laminated and Molded INSUROK have made to industrial progress.

INSUROK has become a symbol of quality wherever plastics are used, and Richardson laboratory, engineering and production skills have written important chapters in the development of many products, both for military and peace-time use.

We mention past accomplishments only because they may help you understand that Richardson can offer experienced help in every phase of the planning and production of plastics parts.

Why not send us specifications today . . . and learn how Richardson experience and facilities can work for you?

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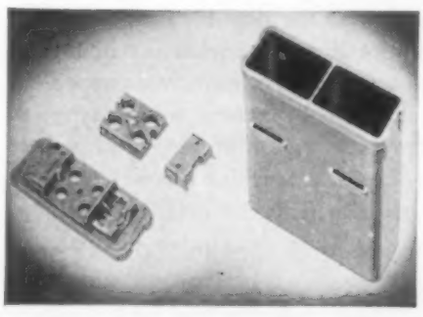
NYLON PLASTIC CARRIES 25% MORE LIGHT FOR MINERS

New battery case of molded Du Pont nylon contributes to better vision, greater efficiency and safety



THE INTRICATE DESIGN and precision molding can readily be seen in these nylon parts of the battery case. One of nylon plastic's most practical features is its ability to be molded in various sizes, shapes or thicknesses, retaining high strength and impact resistance. In the assembly, four leak-proof valves for the cells are mounted in a single nylon plastic block. Parts fall in place with hair-line accuracy. Then the case is sealed by the magnetically locked cover.

This battery case for the new EDISON miners' cap lamp contains four cells instead of the conventional three. Yet there's no appreciable increase in size or weight in the battery case over the former 3-cell models. The increased voltage and wattage of the battery permits the use of a bulb that lasts longer and throws off a stronger beam of light.

Nylon was the choice of Thomas A. Edison, Incorporated, the designers, because it serves both as insulation between the steel cells of the battery and as an outer case which combines light weight and compactness with resistance to abrasion, impact and corrosive mine waters.

Maybe there's a spot on your production line for nylon's outstanding properties. It's easy to get the facts on nylon and all other Du Pont plastics. Write our most convenient office for literature.

E. I. du Pont de Nemours & Co. (Inc.), Plastics Department, Main Sales Offices: 350 Fifth Ave., New York 1, N. Y.; 7 S. Dearborn St., Chicago 3, Ill.; 845 E. 60th St., Los Angeles 1, Calif.

Nylon parts molded by Vulcanized Rubber and Plastics Co., Morrisville, Pa., for Thomas A. Edison, Incorporated, West Orange, N. J.

DU PONT
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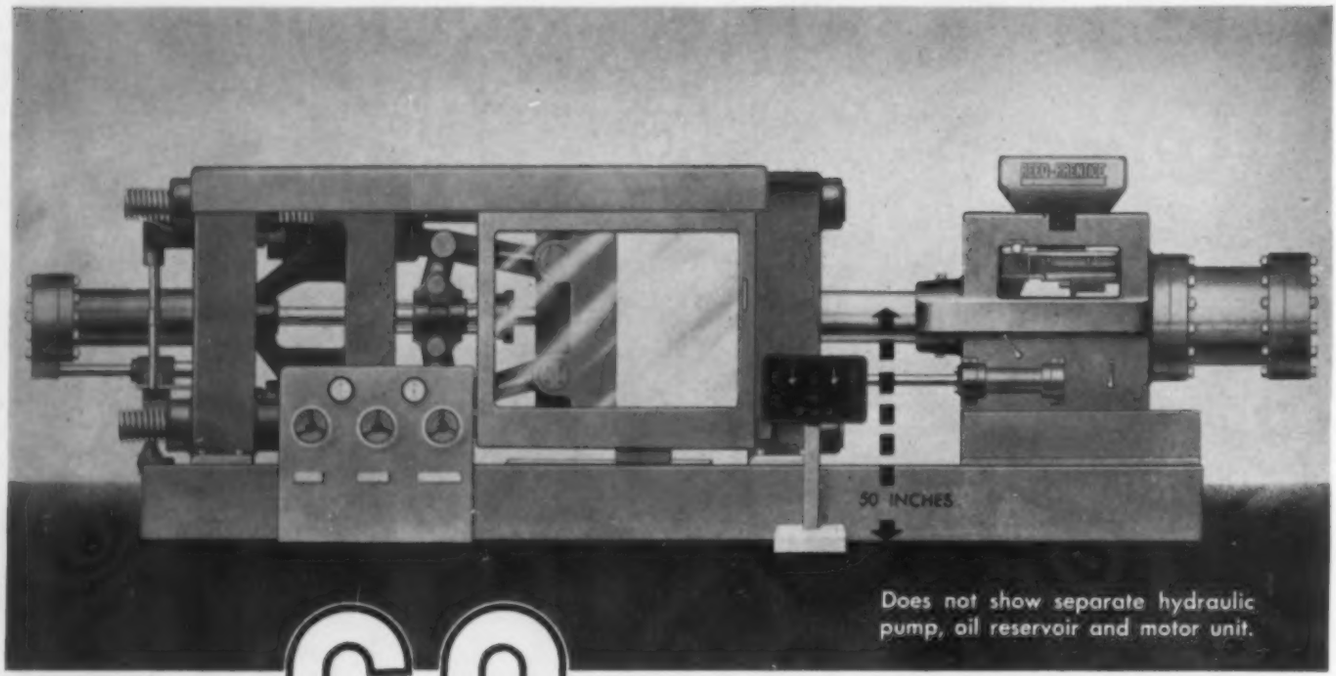
Plastics
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

IT'S *New...* ...IT'S BIG!



Does not show separate hydraulic pump, oil reservoir and motor unit.

THE 10 J 60 oz. REED - PRENTICE Injection Molding Machine

This new 10J-60 oz. model will give you bigger molding capacity . . . bigger profits! It will produce 60 ounces per shot of acetate or 48 ounces per shot of styrene with a plasticizing capacity up to 250 lbs. per hour. A maximum of 150 cycles per hour plus this larger mold capacity assures production that places the molder in a commanding position in the competitive field.

As shown above, the "working height" is just right! It is only 50 inches from the floor to the center of the heating cylinder, providing maximum accessibility to molded pieces — an important feature often overlooked in large capacity machines of this type.

New construction and operating developments have been incorporated with the popular features of the regular Reed-Prentice line to provide maximum machine efficiency and economy. The improved copper core heater is held in place by a new wedge type clamping device to provide easy mounting and removal . . . in fact, the 10J-60 oz. machine is completely engineered for easy maintenance. For detailed specifications write Dept. "D" for descriptive circular.

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Celanese Corporation of America, Plastics Division, Dept. 1-H, 180 Madison Avenue, New York 16, N. Y.

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*Reg. U. S. Pat. Off.

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● Be sure to identify all your products made from the *Fire-Resistant* type of *Resproid* with the special yellow and black tag carrying the words, *"Resproid — Fire-Resistant."*

Memo to Molders

- **Reduce your Pre-Mixing Time . . . . .**
- **Secure Complete, Uniform Dispersion of Plastics Ingredients . . . . . .**
- **Profit from Improved Color Blending . . . .**

with the

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We suggest that you consider the application of the "ENTOLETER" Mixer to your molding problems. Inquiries receive prompt attention.

Now in operation by a number of enterprising molders, who are compounding and coloring plastic materials, the "ENTOLETER" Mixer is producing amazingly uniform mixtures of plastic ingredients; including improved resin dispersion and homogeneous mixing of pigments and dyes. Results are secured in faster time . . . at lower cost.

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Company.....

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It's made of... SPEED ALLOY

A NEW Time Saver Steel for "these times"

This plastic mold, with yokes of Speed Alloy and hardened tool steel inserts, was made by Chicago Mold Engineering Co. Yokes were rough machined, then normalized, then finish machined, pack carburized, oil quenched and drawn at 450°F. Hardness of 58 Rockwell C resulted.

If you're tired of wearing down pencil points figuring jobs, Speed Alloy Hot Rolled Alloy Steel Plates are the answer. Users are calling it "the most economical mold and die steel available." Bridges the gap between carbon and tool steels. Deep hardening properties (surface hardness in excess of 40 Rockwell C, core hardness up to 37 Rockwell C, depending upon section, are typical) result from the addition of chromium and molybdenum, permitting use where relatively high compressive strengths are required.

Speed Alloy gives real ease of machining with economical high polishing of surfaces at varying hardnesses. Essentially an oil hardening steel, a wide range of physical properties are obtainable by varying heat treatments, allowing wide diversity of use ranging from zinc die casting dies and machined parts to plastic compression molds. Ask for Bulletin 905.

Speed Alloy plates stocked in widths up to 72" and thicknesses to 6" by Speed Steel distributors, which can be flame cut to specifications, an advantage not obtainable in competitive steels.

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100% H-P-M at Minnesota Plastics!

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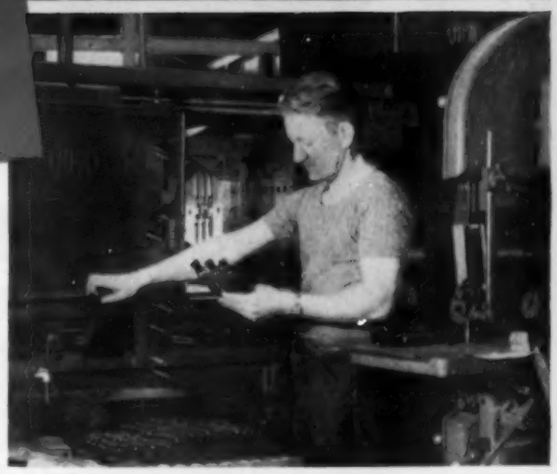
H-P-Ms are famous for fast cycle . . . maximum capacity . . . quick die change-over . . . long die life. You, too, can benefit from the top performance built into these all-hydraulic units. Molders swear by them!

A nearby H-P-M engineer would like to discuss the profitable side of plastics molding with you. Why not call him in today?

THE HYDRAULIC PRESS MFG. COMPANY
1010 Marion Road Mount Gilead, Ohio, U.S.A.



Here's an unusual job! Six heavy screw driver handles—a 23 oz. shot of butyrate—molded on an H-P-M "16 oz."

Send for a free copy of Bulletin 4802. It will tell you what H-P-M injection machines will do for you. Write today.

HPM

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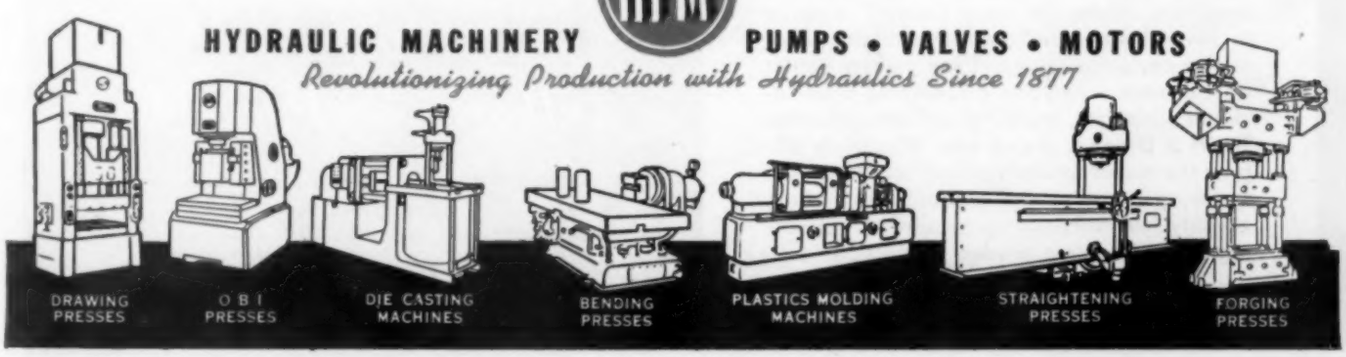
Revolutionizing Production with Hydraulics Since 1877



SUCCESSFUL GIFT PACKAGE
— IN CORRUGATED

At the H & D Package Laboratory, leather and wood and linen patterns are often simulated in corrugated board. Distributors of specialty items, are capitalizing on H & D ingenuity and craftsmanship to sell merchandise. Relatively inexpensive, distinctive in appearance, rugged in construction, these H & D corrugated boxes are a complement to the highest quality products.

FLUORESCENT LIGHTS
Shipped Safely in CORRUGATED BOXES

A complicated problem of packaging fluorescent fixtures—odd-shaped, bulky, fragile—has been solved with an H & D engineered box which has reduced the entire packing operation to a mere 70 seconds! An ingenious arrangement of six interior pieces of corrugated board provides more than ample protection. The packed product can be stacked and loaded and shipped as safely as any other type of merchandise — thanks to H & D package engineering.

PRODUCT QUALITY is reflected by *The Package*

FAMILY NAME FEATURED
in "Look-Alike" Packages

Quick, easy identification and selection are important where the same product is made in several sizes and several models. Automotive parts, for example, win greater dealer acceptance when the packaging plan includes simplicity, legibility and convenience. The H & D boxes shown here effectively display the manufacturer's name, conserve shelf space, give necessary product information, simplify inventory-taking, require no repacking, provide ample product protection.

H&D BOXES

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COLORFUL

SMOOTH

EASY

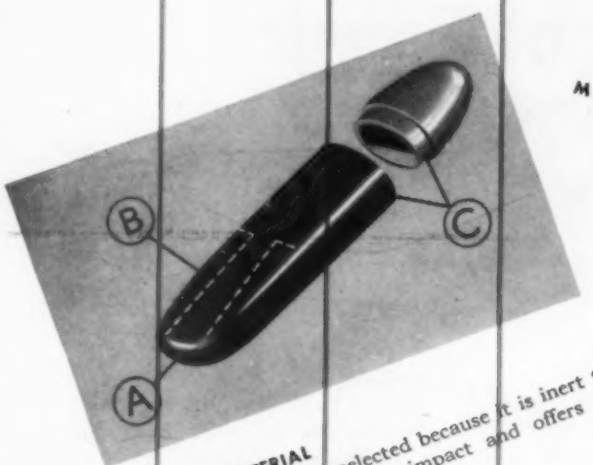
to the eye

to the touch

to assemble

ARE BETTER BECAUSE OF PLASTICS

MANY THINGS



MOLDING MATERIAL
Cellulose acetate was selected because it is inert to metal, highly resistant to impact and offers an unlimited color range.

MOLDING METHOD
Both the cap and the body are injection molded, each in an 8-cavity mold. Approximately 60,000 complete handles are molded in a week.

MOLD DESIGN
The molds are made with a mirror-like finish to produce parts that gleam without buffing. A fine, tapered blade in the mold forms the slot (A) which is only .030" wide. These slots extend through flanges (B) which support the knife blade inside the handle to a depth of 1½". Dimensions of cap and body at (C) are kept to close tolerances to insure easy assembly and rigid bonding.

WRITE for *Aico's new portfolio of plastic applications. See how dozens of common articles have been improved by the use of plastics.*

At first sight the bright, satiny finish of this molded plastic handle calls for attention. Pick it up and the smooth, comfortable feel says . . . "working with this knife will be a pleasure".

AICO engineers, drawing on more than 30 years of precision molding experience with all materials and methods, are quick to combine saleability and practicality in all their recommendations . . . *plus* economy of manufacture. These putty knives, for instance, are complete by simply forcing the blade into an accurately molded slot. AICO engineers will be glad to help you apply the advantages of plastics to your product.

Aico PRECISION MOLDING

AMERICAN INSULATOR CORPORATION

NEW FREEDOM, PA.

SALES OFFICES: Cleveland—Detroit
New York—Philadelphia

THIS IS YOUR

...aterial already compounded.

Now, however, comes the announcement by Machinery Div. of Welding Engineers, Inc., Norristown, Pa., of a line of Universal Compounding-Extrusion machines which will take in virgin material and plasticize, compound, and color it in one continuous operation. Not only can one of these machines make it possible for the extruder or molder to produce his own molding materials to most specifications of plasticization, color, etc., but it also can be set up as a pelletizer or as an extruder using conventional extrusion dies.

Basically, this versatile machine is an extruder using two worms. The special worm design makes possible the thorough compounding of thermoplastic ...so gives a very high output in

As reported in MODERN PLASTICS (June, 1949)

● Whether you mold or extrude thermoplastics, the amazing Compounder-Extruder* can literally revolutionize your present plant set-up and effect major reductions in your costs of operation.

From now on your inventory problems are at an end. You'll stock only pure pigments or dyes, straight resins and plasticizers and other components. And you'll order these plain uncompounded materials in bulk at lower cost per pound.

And from now on you will compound, extrude or pelletize special formulations from these raw materials *as they are needed* and in just the right amounts for particular jobs.

Suppose you're an extruder. Then from now on you'll often be able to save the *entire cost of compounding* because the Compounder-Extruder can compound and extrude in a single continuous operation. Hence, the cost of extruding becomes the cost of compounding as well.

Perhaps you're an injection molder. Then you will henceforth be able to compound and color injection molding materials to your own specifications and form them into pelletized feed ready for your presses in one continuous operation.

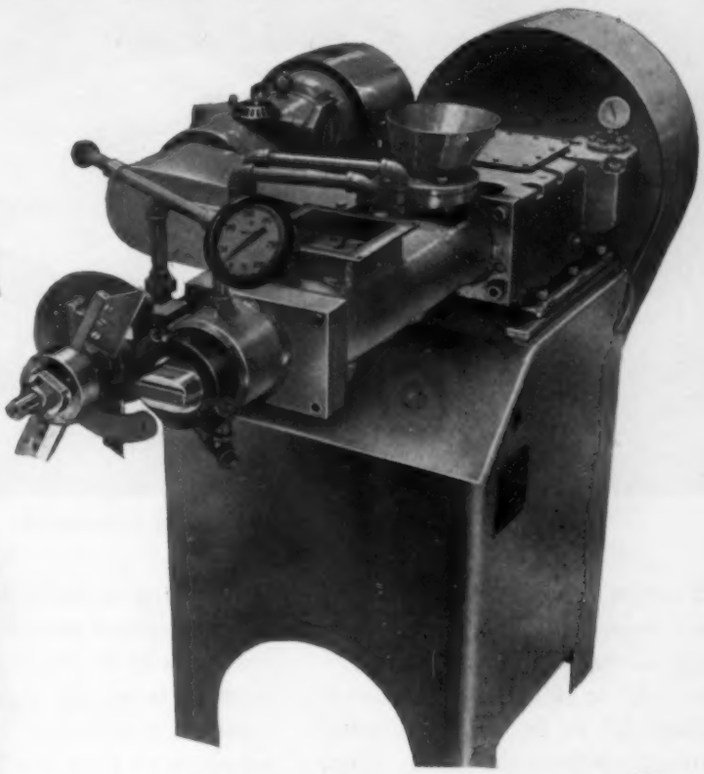
And you will be able to handle your own scrap reclamation. A Compounder-Extruder can reclaim scrap just as effectively as it can compound and extrude.

PAYS FOR ITSELF

When operated at or near its rated capacity, the Compounder-Extruder can completely defray its purchase price well within the authorized depreciation period for capital equipment due to the *direct* savings made on compounding costs.

And *indirectly*, through simplified inventory practices and plant operation procedures, the Compounder-Extruder effects additional impressive savings.

REVOLUTION!



Amazing machine compounds extrudes and/or pelletizes in single pass!

OBTAINABLE IN FIVE SIZES

Smallest of the Compounder-Extruders is the Series 2000 (with double 2" worms) having an average output of 100 pounds per hour. Largest of the models is the Series 6000 (with double 6" worms) capable of compounding and extruding at an average rate of 1300 to 1500 pounds every sixty minutes.

WRITE FOR DETAILS NOW

With the amazing Compounder-Extruder you can completely revise your present pricing system, your present inventory practices, and your present methods of plant operation. That's why you are urged to begin your investigation of the potentialities of this machine now.

Write today for detailed specifications, prices and delivery dates. Be sure you include data on the type of operation for which you contemplate using this revolutionary dual-purpose machine.

*patents issued and pending

HOW IT WORKS

The Compounder-Extruder contains an exclusive "pressurized" compounding cylinder that contains two interacting worms of special design. These worms knead and work the raw materials under high pressure and elevated temperatures, then extrude the completely compounded end-product (and pelletize it as well, if desired). Action of the machine is largely automatic and merely involves feeding of raw materials into the hopper. A single operator can successfully tend several machines without other assistance.

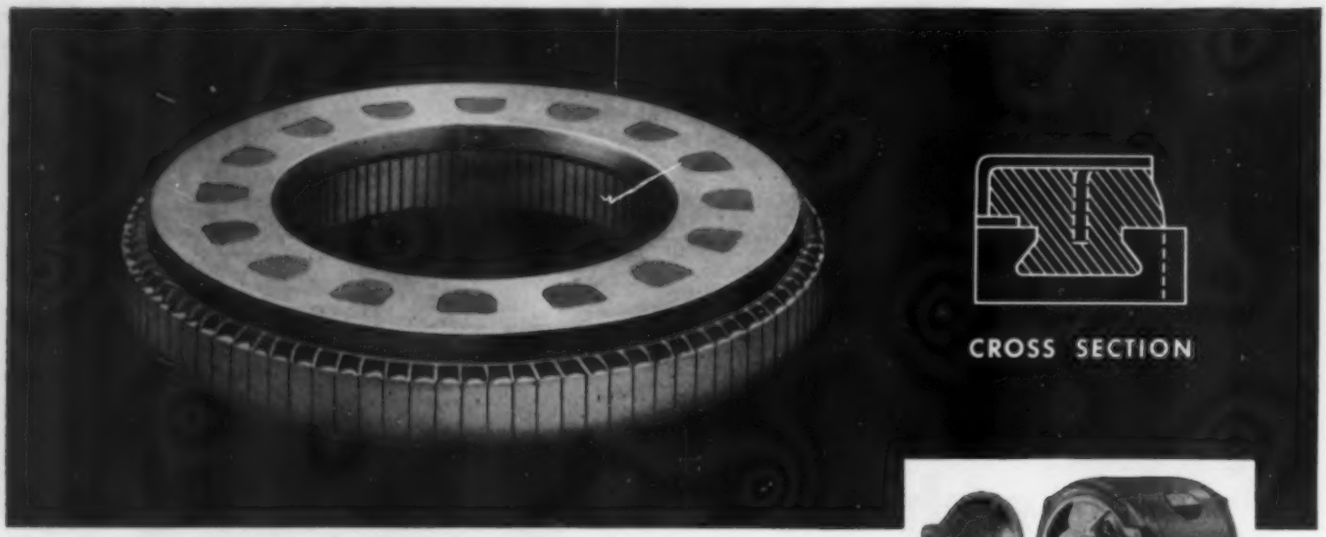
machinery division

WELDING ENGINEERS, INC.

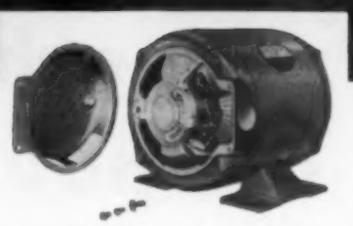
NORRISTOWN, PENNSYLVANIA

IT'S PLASTICS—OR ELSE

for this B-Line Radial Motor Commutator



Advanced design radial commutator—moulded by Kurz-Kasch.



A great new Brown-Brockmeyer Motor—B-Line brush lifting type.

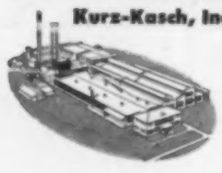
96 COPPER SEGMENTS, 96 interleaving mica segments, 1 mica ring, 1 steel ring—all but one with intricate contours! All to be insulated to prevent arcing. All to be bonded together without displacement of any insert and without seepage of bonding material. The completed assembly to withstand machining—dipping in molten solder—150 lbs. of centrifugal force per segment at 10,000 RPM! That was the problem. Obviously it called for plastics. But what a job for plastics!

Brown-Brockmeyer engineers knew what superior performance hinged on this advanced design. It allows placement of the centrifugal brush-lifting device in the commutator case, without the complication of rods, pins or hinges. It allows more room for better wire connections and conserves shaft length. It even saves copper. It's a great step in motor design and moulding technique—and it's in production now.

Wouldn't you like to work with a moulder that can cooperate closely with your Design and Engineering sections—that's staffed and equipped to handle large runs on intricate jobs —that knows the importance of tying in with your production schedules? We've spent more than three decades earning that kind of a name. And we can talk your job over now.

Kurz-Kasch

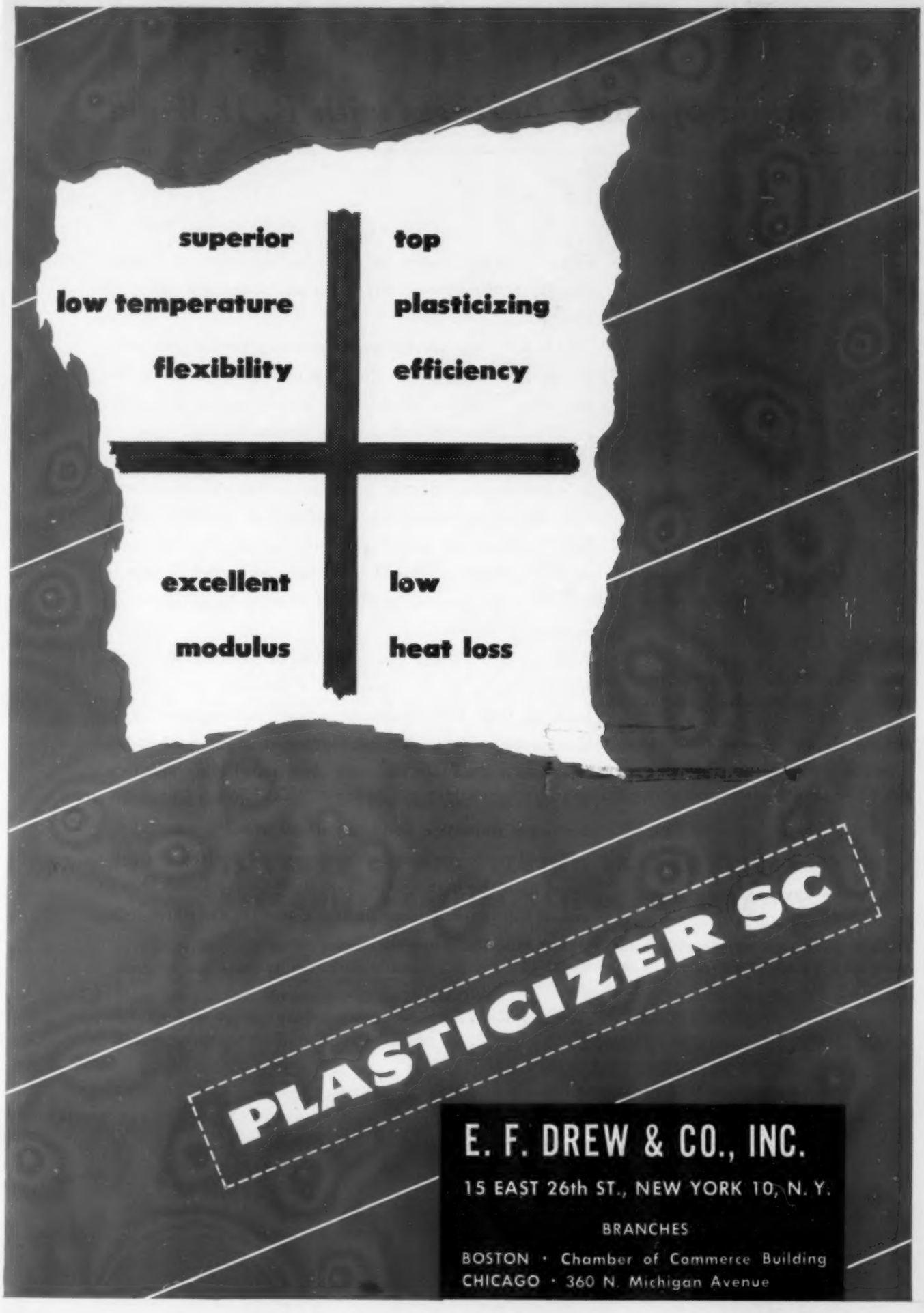
FOR OVER 33 YEARS PLANNERS AND MOULDERS IN PLASTICS



Kurz-Kasch, Inc. • 1415 South Broadway • Dayton 1, Ohio

BRANCH SALES OFFICE: New York, *Lexington 2-6677* Chicago, *Harrison 5473* • Detroit, *Woodward 2-5214* Philadelphia, *Granite 2-7484* • Dallas, *Lakeside 1022* Los Angeles, *Prospect 7503* • St. Louis, *Rosedale 3542* Toronto, Canada, *Adelaide 1377.*

EXPORT OFFICES: 89 Broad Street, New York City, *Bowling Green 9-7751.*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plasticizing
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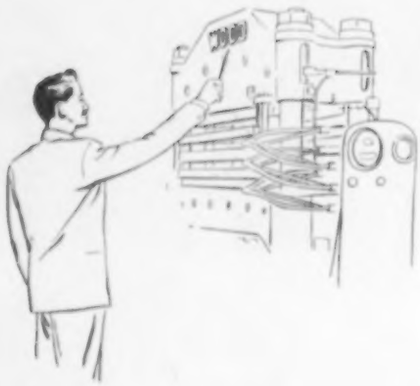
BRANCHES
BOSTON · Chamber of Commerce Building
CHICAGO · 360 N. Michigan Avenue

the wisdom of doing business with R. D. Wood



The industrial buyer today is looking more and more closely at the comparative feature-for-feature value of the products he buys.

It has become increasingly necessary for his purchases to justify themselves on the basis of sound business economy—for increased production, better quality in output, rapid self-amortization, or some similar factor.

This situation is healthy. In fact, it fosters the competition desirable under the American free enterprise system.

Under this system, those industrial products which have maintained high excellence in manufacture will continue to be sold, and will contribute their worth to uplifting the general quality of everything produced in industrial America.

We at R. D. Wood have believed in this principle—and manufactured by it—since our Company was founded back in 1803. Our hydraulic presses and equipment for the metalworking, plastics, rubber, and plywood industries have always withstood alert purchasing scrutiny. We have invited, and will continue to invite, feature-by-feature examination and comparison of our products.

You'll never find an inferior piece of hydraulic equipment with the name WOOD on it. We have found that in almost 150 years of doing business, this type of unrelenting policy is nothing less than wisdom.

• • •

Write for R. D. Wood catalogs on hydraulic presses and equipment.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS

EST. 1803

R. D. Wood Company

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

VISIBILITY

by **Swedlow**

F2H-1

. . . the Navy BANSHEE twin-jet fighter, by McDonnell of St. Louis, Mo., develops an almost incredible power equivalent to a giant four-engined bomber.

Its striking improvements include, according to a late McDonnell news release, "improvements in pilot visibility"... of course, VISIBILITY by SWEDLOW... a phrase being made increasingly famous by SWEDLOW engineering contributions to one after another of the triumphs of the aircraft industry.

15 YEARS OF PIONEERING IN ACRYLICS— RECOGNIZED SPECIALIZATION IN AIRCRAFT

. . . plus perfection in optical properties in astrodomes, canopies and windows, regardless of size . . .

These are the major factors in making SWEDLOW a leader in serving the great names of the aircraft industry throughout the U. S. A. and Canada.

Among other notable new developments in which SWEDLOW skill in acrylics had a share are the latest achievements of . . .

- BOEING AIRCRAFT COMPANY
- CONSOLIDATED VULTEE AIRCRAFT CORPORATION
- DOUGLAS AIRCRAFT COMPANY, INC.
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- NORTH AMERICAN AVIATION, INC.
- UNITED HELICOPTERS, INC.

Swedlow PLASTICS CO.

We shall be glad to assign a staff engineer to work with you in solving any problems in acrylics connected with new developments in the industry.

Write, wire or phone TODAY!

3757 WILSHIRE BOULEVARD • LOS ANGELES 5, CALIFORNIA

Industry's most Versatile Heaters

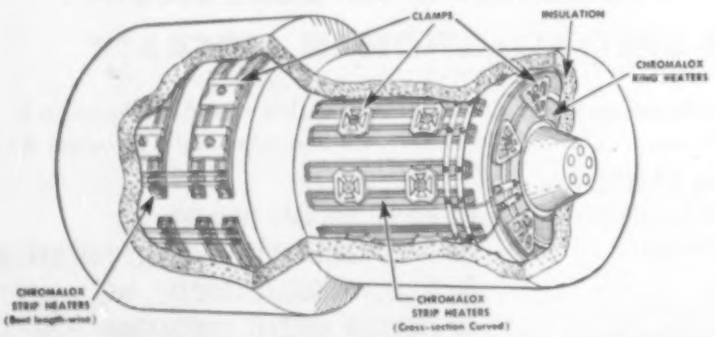
FOR USE ON FLAT OR CURVED METAL SURFACES WHERE CONCENTRATED HEAT IS REQUIRED

Rugged CHROMALOX Electric Strip Heaters can be clamped to tanks, platens, dies, molds; to vats, rolls, barrels, cylinders; to pipes, tubes, air-ducts, etc.—and bent lengthwise or on radius.

Simple to install, economical in operation, they give clean, dependable, accurately controlled heat when and where you need heat for product or process.

Discuss your requirements with a CHROMALOX Application Engineer. He will show you how CHROMALOX Electric Heat will save time, improve production and increase efficiency in your plant.

A Typical Chromalox Strip Heater Application



These easily installed Chromalox Strip Heaters assure accurate temperature control, dependable around-the-clock service.

CHROMALOX

Electric Heat for Modern Industry

EDWIN L. WIEGAND CO. 7603 THOMAS BLVD., PITTSBURGH 8, PA.

For the full story of Electric Heat

"The Fastest Growing Industrial Tool"

See your Chromalox Application Engineer

Thousands of industrial plants—faced with increasing operating costs—have turned to efficient and dependable electric heat. Chromalox Application Engineers have assisted many plants to make time and money saving installations.

Chromalox Application Engineers, located in 35 key cities, will gladly work with you too, in helping modernize your production facilities where heat is needed. These men can give you expert technical assistance—backed by years of experience—and show you how your heating operations can be made more efficient and more dependable at lower cost and less maintenance.

So, if you use heat in any form in your plant for production and processing, take advantage of Chromalox "on the job" assistance and recommendations. Phone, wire or write today; there is no obligation.

Get this Booklet!

It contains a wealth of application ideas you can use in your plant . . . and lists the names and addresses of Chromalox Application Engineers serving you. Write for your copy today.

1C-38.

Puzzled by a bonding problem?

–then try Pliobond –it bonds "anything to anything"

Mahogany veneer bonded permanently to sheet steel with ***Pliobond*** *—lasting answer to adhesive problems.*

IF your production problem is the bonding of *any* material, then try **Pliobond** — the new idea in adhesives. **Pliobond** was developed by Goodyear to handle the widest possible range of materials-bonding problems with a single, easily-applied adhesive.

With **Pliobond,** you can secure permanent bond between any of these materials either to themselves or each other:

IRON COTTON DUCK
PLASTIC SYNTHETIC RUBBER
GLASS STAINLESS STEEL
ALUMINUM CANVAS
COLD-ROLLED STEEL
HOT-ROLLED STRIP STEEL
— and many more.

Pliobond can be brushed, sprayed, spread or roller-coated on — bonds hot (dry) by reactivation or cold (wet). Either way you use it, **Pliobond** is the answer to your adhesive problems.

For an adhesive with outstanding strength, permanence, quick set — resistance to water, oils, grease, wax, flexing and fungus growth — turn to **Pliobond.** For full details, write:

GOODYEAR, CHEMICAL DIVISION,
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USE PROVED *Products*

GOODYEAR

Pliobond—T.M. The Goodyear Tire & Rubber Company

Precision Calendering for Uniformity a

PROGRESSIVE rubber manufacturers are constantly striving for greater uniformity in their product. This is particularly true in the case of tires for passenger automobiles, where tire unbalance must be minimized due to the high speeds. Precision calendering is the answer to this problem of greater uniformity.

To illustrate the magnitude of the problem of producing a uniform product with existing standard-type calenders, the chart at right should be of value. It shows the non-uniformity of ordinary calendering methods during a regular production run on a standard sleeve-bearing rubber calender. The chart is calibrated to indicate variations over and under the standard weight of coated fabric in ounces per square yard.

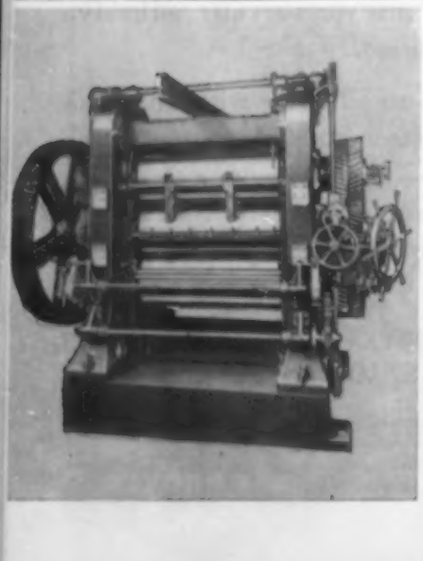
Allowable variation is one-half ounce, light or heavy. It is apparent that this tolerance has been exceeded during a substantial portion of the eight-hour run. However, the results shown are not at all unusual since they represent the accuracy normally obtained with a well maintained sleeve-bearing calender.

An examination of the chart between noon and 1:00 P.M. shows that during this time, the calender exceeded tolerances on the light side for six periods averaging two and one-half minutes each, or a total of fifteen minutes. On the other hand, excessive tolerances on the heavy side occurred during five periods averaging two minutes each, or a total of ten minutes. Inasmuch as this calender was operated at a speed of fifty yards per minute, it is obvious that about 750 yards of fabric were actually lighter than the acceptable minimum, and 500 yards were heavier than the prescribed maximum.

Present practice allows acceptance of any completed roll of fabric which weighs within certain limits. The above example illustrates how non-uniform weights of yardage can occur, even though the finished roll passes the final weight inspection.

It is apparent therefore, that existing calenders are delivering a product which may have, on one hand, under-weight stock with consequent quality risk in the final product and, on the other hand, waste material due to excessive gauges.

We invite your attention to the specifications given below, comparing features of the old-style calender with those of the modern precision calender. A study of these specifications illustrates the reasons why the modern precision calender is so well suited for improving quality and uniformity of finished product.



COMPARISON OF SI

Typical Old Style Calender in Current Use

ROLLS:

. . . are chamber bored. Temperature differences between center and ends of roll face affect roll crown and contour.

ROLL BEARINGS:

. . . full bronze lined, arranged for grease or force feed oil lubrication. There are no seals at ends of box to prevent leakage of lubricant onto roll face. Sufficient running clearance must be allowed for operation of rolls at topmost temperatures.

ROLL CROWN:

Rolls are ground with proper contour to produce uniform gauge on most popular stock. Other stocks of different hardness and separating forces cannot be run at uniform gauge.

ROLL ADJUSTMENT:

Adjustment of all rolls is obtained through single hand wheel or motor. Top roll operates thru a screw that lifts top roll bearing boxes by means of a lifter plate.

GEARING:

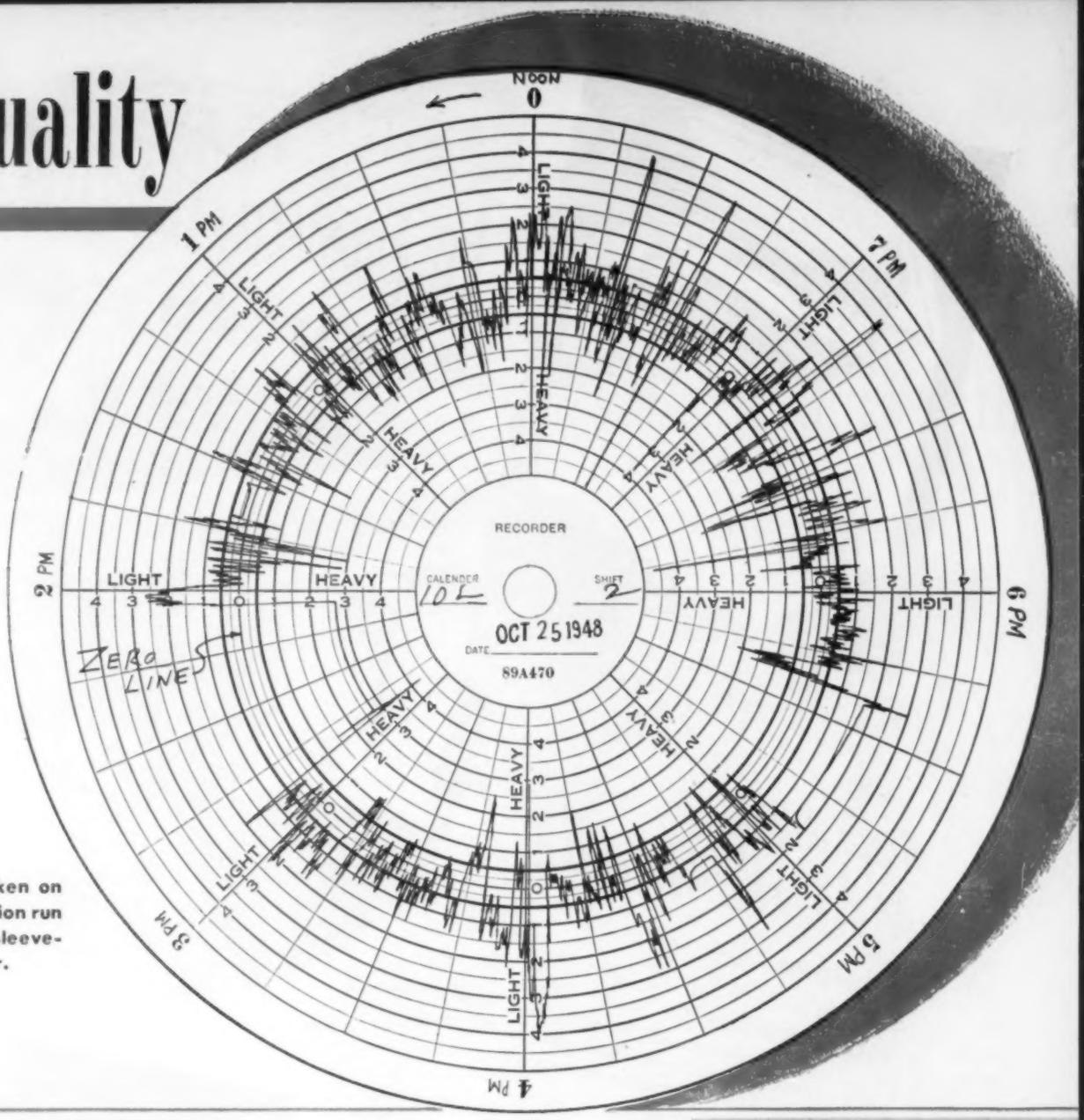
Connecting gears, with cut double-helical teeth, are mounted on the rolls, together with bull gear and pinion which supply the power to the middle roll. These are enclosed in oil-tight, light metal gear guards so that bottom gears can dip in oil bath and carry lubricant to top gears.

ADAMSON UNITED COMPANY

AKRON 4, OHIO

SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

ty and Quality



Weight Chart taken on a regular production run of a standard sleeve-bearing calender.

SPECIFICATIONS

Adamson United New Precision Calender

ROLLS:

. . . are arranged for cooling and heating through longitudinal holes drilled near periphery of the roll. Uniform temperatures at center and ends of roll prevent uneven expansion and hold original contour.

ROLL BEARINGS:

Equipped with precision-type roller bearings adjusted to zero clearance, flood oil lubricated at controlled temperature. Close fitting seals effectively retain all lubricant, preventing stock contamination. Rolls are ground in own bearings to assure exact concentricity under operating conditions.

ROLL CROWN:

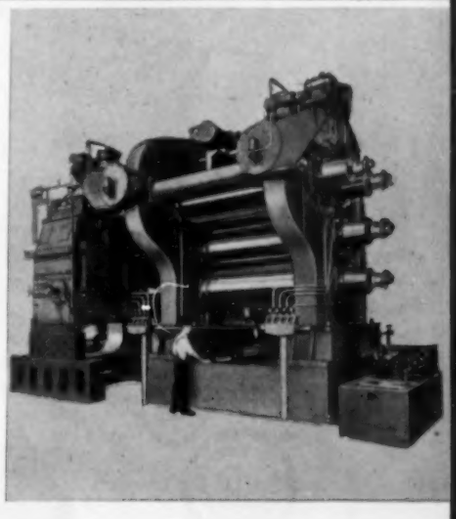
Adjustment for variable roll deflection obtained by crossing roll axes. Wide variety of stocks can be run with complete uniformity of gauge.

ROLL ADJUSTMENT:

Top roll stabilized by hydraulic push-back devices, which remove clearance from the screwdown mechanism. Leveling of individual rolls accomplished by push-button controls, located for operator's convenience.

GEARING:

Each roll is individually driven through a universal spindle, permitting crossing the roll axes to compensate for roll deflection. A separate pinion stand mounts the fine-pitch roll connecting gears in a rigid housing. Connecting gears run on fixed centers, and are oil flood lubricated.



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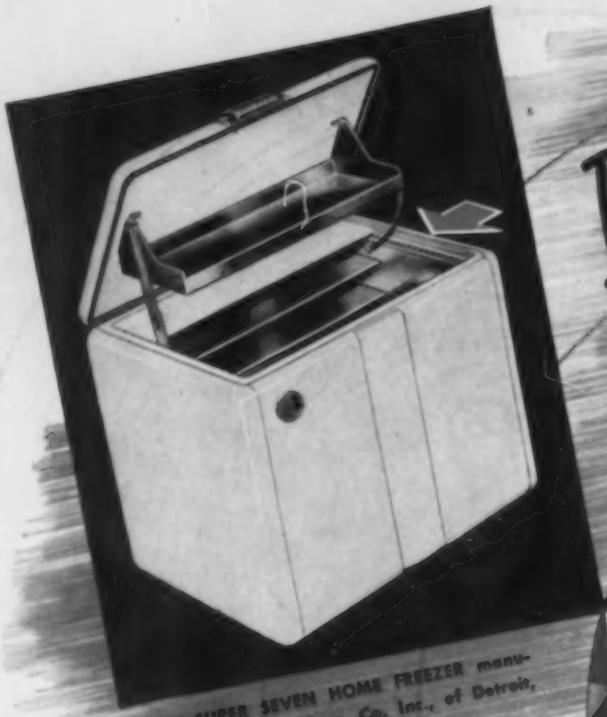
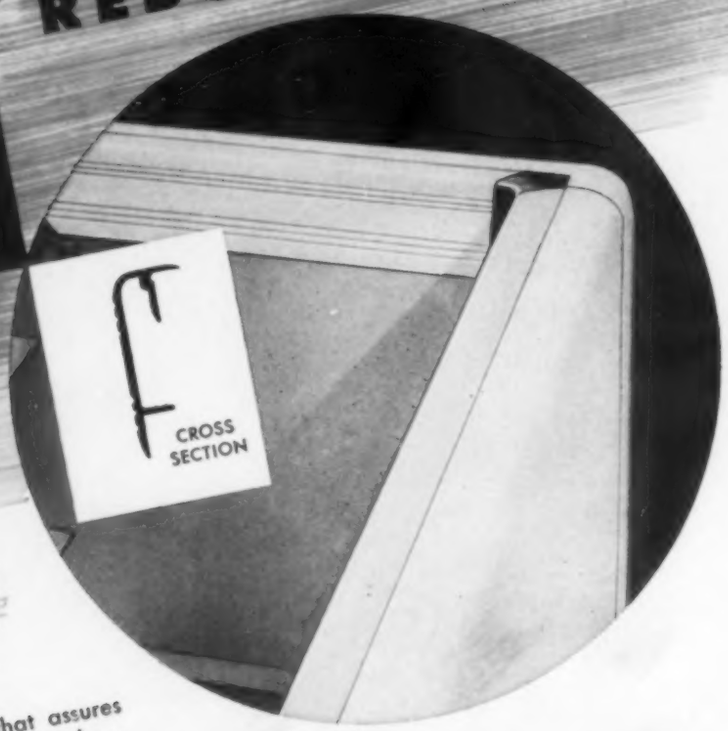


ORLEY SUPER SEVEN HOME FREEZER manufactured by Orley Bros. Co., Inc., of Detroit, Michigan.

Improved Product... REDUCED COST



with another MACOID-MADE product!

THE PROBLEM:
To develop a new breaker strip that assures customer satisfaction and adds sales appeal . . . yet effects production economies.

THE SOLUTION:
After MACOID engineers were consulted, they redesigned the breaker strip, utilizing a new material.

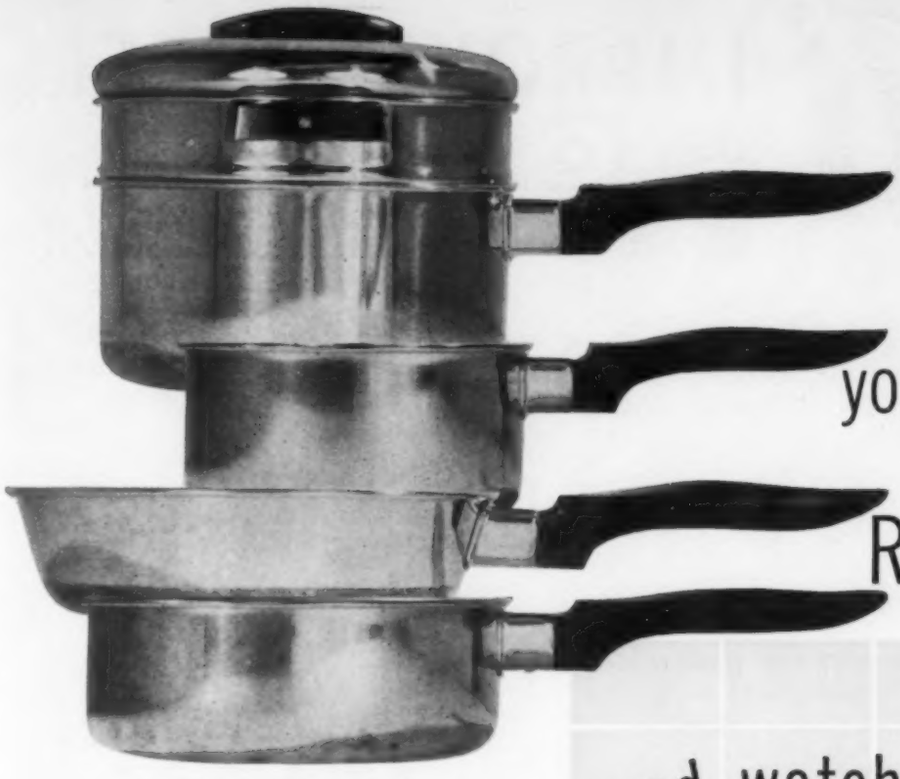
THE RESULT:
The new material and design were adopted and solved all problems. CUSTOMER SATISFACTION is assured with a material that is . . . easy to clean, durable, heat resistant, and provides an efficient seal. SALES APPEAL is added with a more streamlined design—a smoother strip, no exposed screws. PRODUCTION ECONOMIES are accomplished because the new breaker strip is easier to apply resulting in reduced labor costs.

When your product needs a "lift", let MACOID help you. If you are designing a new product, or re-designing a present one, MACOID's facilities and highly-skilled technicians will serve you from idea to the finished product.

Originators of Dry Process Plastics Extrusion

DETROIT MACOID CORPORATION

Extrusion and Injection Molding • 12346 CLOVERDALE, DETROIT 4, MICH.



Ekcoware "Starter Set" and double boiler with lustrous, durable Resinox handles . . . molded by Chicago Die Mold Mfg. Co., 4001 W. Rightwood Ave., Chicago, Ill. for Ekco Products Co., 1949 North Cicero Ave., Chicago 39, Ill.

Handle your product with RESINOX 10231 and watch sales climb!

Are you looking for a new, sure-fire selling feature these days for your pots, pans, or appliances? Then grab hold of the new handles molded from Resinox 10231!

Monsanto developed this new phenolic especially for handles, knobs, housings, bases, etc. It *adds four sales pluses* to your product:

1. ***New higher heat resistance.*** **Tests prove Resinox 10231 will withstand 500° F. exposure for 240 hours. Will not blister when transferred directly from room temperature to hot oven.**
2. ***Deeper, richer black tone . . . with best gloss and surface finish ever offered.***
3. ***Durable*** **. . . excellent chemical and moisture resistance, formulated to resist dulling and greying, washing and wear.**
4. ***Applicable to new designs.*** **Resinox 10231 has proved less critical to mold, adapts readily to new ideas.**

From the manufacturer's standpoint, handles of Resinox 10231 have two more important features: faster cure cycle and "one-shot" production . . . with finishing, machining, all done at once.

Molders, manufacturers, designers . . . it will pay you to investigate Resinox 10231 now. Use the coupon to get full information.

Resinox: Reg. U. S. Pat. Off.

FOR A BIGGER DOLLAR'S WORTH, BUY AND USE MONSANTO PLASTICS

MONSANTO
CHEMICALS AND PLASTICS

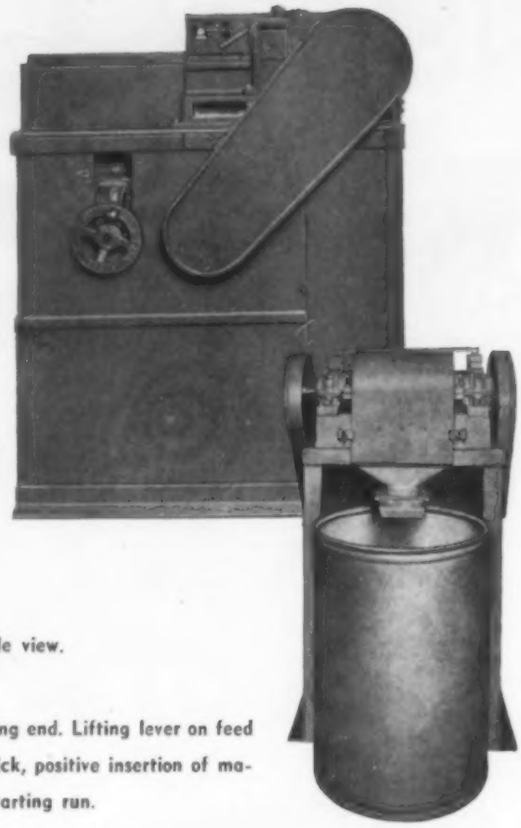
MONSANTO CHEMICAL COMPANY
Plastics Division, Dept. MPLP 20
Springfield 2, Mass.
Please send me full information on Resinox 10231
Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____

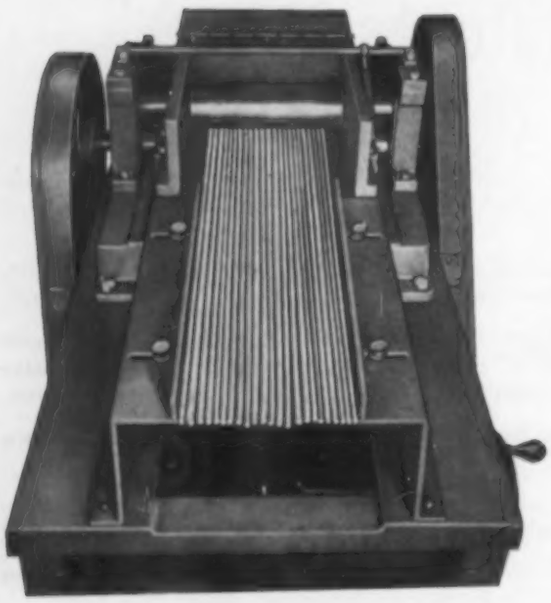
SERVING INDUSTRY . . . WHICH SERVES MANKIND

NEW! IMPROVED DICER

features variable extrusion speed feed control and lower power consumption!

- 10 to 50 ft. per min. speeds by turning variable speed control handle, without changing sprockets.
- 1/8" cube cut on standard dicer; simple sprocket change adjusts pellet sizes up to 5/16".
- 9½" max. feed width on standard dicer.
- 1½ H. P. motor meets max. power requirements because stationary bed knife is set at shear cut, reducing power consumption.





ABOVE: Control side view.

LEFT: View of feeding end. Lifting lever on feed roll allows quick, positive insertion of material when starting run.

RIGHT: Discharge end. Note waste-preventive shut-off gate on chute, also chute flange connection which prevides for stocking attachment if desired.

Here it is! — the B & J Pellet-Dicer — for manufacturers of thermoplastic materials, vinylite or similar compounds. Attachment available, as accessory to standard machine, for slitting continuous sheets, cubing them in same operation. Write for full-detailed folder and list of representatives.

BALL & JEWELL, INC.

22-28 FRANKLIN ST., BROOKLYN, N. Y.

CALL ON PFIZER FOR...

THESE CITRATE PLASTICIZERS

TRIETHYL CITRATE

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ACETYL TRIETHYL CITRATE

ACETYL TRIBUTYL CITRATE

● Each of the plasticizers listed above is being produced in increasingly large quantities by Chas. Pfizer & Co., Inc. Each benefits from Pfizer's leadership in the commercial production of high quality citric acid—a leadership backed by years of experience.

These Pfizer chemicals afford a wide range of desirable performance characteristics. Each citrate possesses individual properties applicable to its use in a certain type of plastic.

Acetyl Triethyl Citrate, for one example, is an excellent plasticizer for cellulose acetate, while Acetyl Tributyl Citrate is particularly useful as a plasticizer for vinyl type resins.

With these plasticizers, a key factor is the versatility of the citric acid molecule, which contains one hydroxyl and three carboxyl groups.

Write for samples and technical information. Chas. Pfizer & Co., Inc., 630 Flushing Avenue, Brooklyn 6, N. Y.; 425 N. Michigan Ave., Chicago 11, Illinois; 605 Third Street, San Francisco 7, California.

PFIZER QUALITY®

PFIZER

Manufacturing Chemists Since 1849

SPECIAL PRESSES

ENGINEERED BY ELMES

Good Hydraulic Production Equipment Since 1851

There are times when a *standard press* won't do. Then, it's time to call in Elmes. Whether the press you need is *special throughout,* or just changed from existing designs, Elmes background, facilities, and foresight are shortcuts to satisfaction *and profits.*

A SIMPLE ADAPTATION... Here's an Elmes adaptation that is *both* simple and effective. Basically, it's a standard 300-ton compression press arranged for transfer molding. But it has *two rams*—instead of one—to provide high volume and proper flow. It's compact, economical—has free access front and back.

COULDN'T PERFORM BETTER... Each transfer ram delivers 50-ton pressure while a *separate* pump holds the mold closed. And, had the whole press been developed for this particular use, it *couldn't* perform better. For special presses, and standards, too, it always pays to *"Put Your Pressing Problems up to Elmes."*

Ask for New Bulletin 5200-A. It's Free to Plastics Molders.

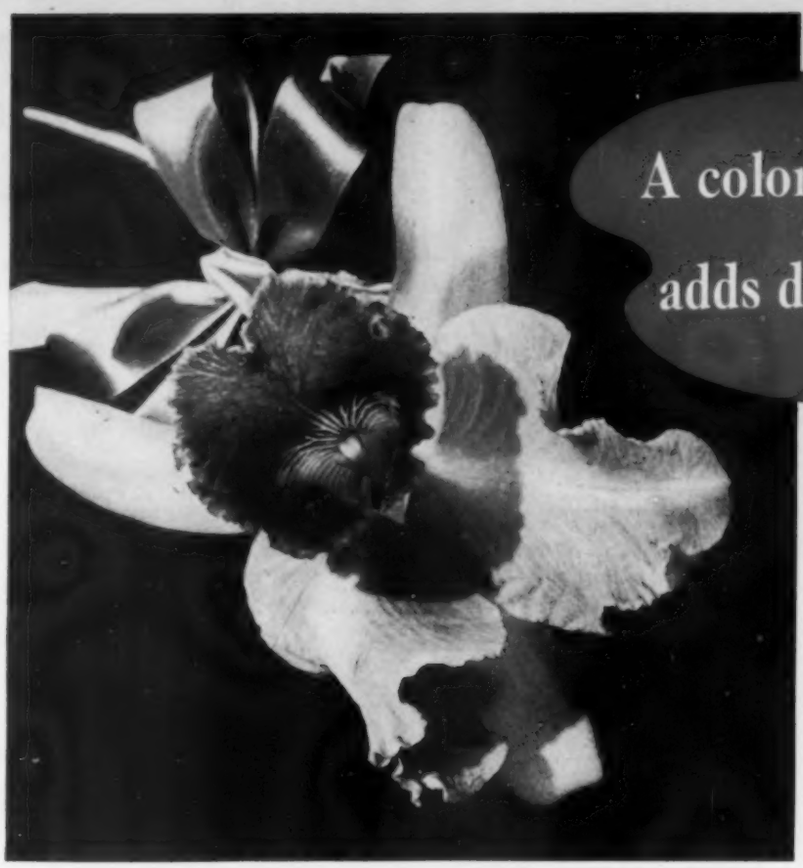
● You can speed plastics molding with modern Elmes equipment. Standard units include a full range of compression and transfer molding presses; Elmes Hydrolairs—the power presses with neither pumps nor motors; hobbing presses; laboratory presses; and Elmes pump-accumulator systems for group press operation.

Elmes hydraulic equipment does these four things —Saves Time... Saves Effort... Saves Maintenance... Saves Money. That's why leaders in the industry are Elmes users. Bulletin 5200-A gives features, specifications, and dimensions of Elmes equipment for plastics molders. Ask your Elmes distributor, or request by mail.

ELMES ENGINEERING DIVISION *of* AMERICAN STEEL FOUNDRIES, Cincinnati 29, Ohio

Distributors in Principal Industrial Centers • *Also Manufactured in Canada*

METAL-WORKING PRESSES · PLASTIC-MOLDING PRESSES · EXTRUSION PRESSES · PUMPS · ACCUMULATORS · VALVES · ACCESSORIES



A colorful NIXON plastic adds distinction to a V.I.P.*

**V.I.P. stands for Very Important Product. Yours, of course.*

Nixon Cellulosic Plastics have many advantages, but chief among them is the quality of colorfulness. They are available in an unlimited range of opaque and variegated colors as well as in translucent and transparent. Add distinction and sales appeal to your important products by fabricating or molding them from Nixon Cellulosic Plastics.

Tough

Nixon Cellulosic Plastics stand up under hard service.

Resistant

Nixon Cellulosic Plastics are resistant to cold shock, dirt and dust, water, weak acids and alkalis, temperature changes, etc.

Easily Fabricated

Mold a Nixon Cellulosic Plastic to specifications. Shape and form it to meet your requirements.

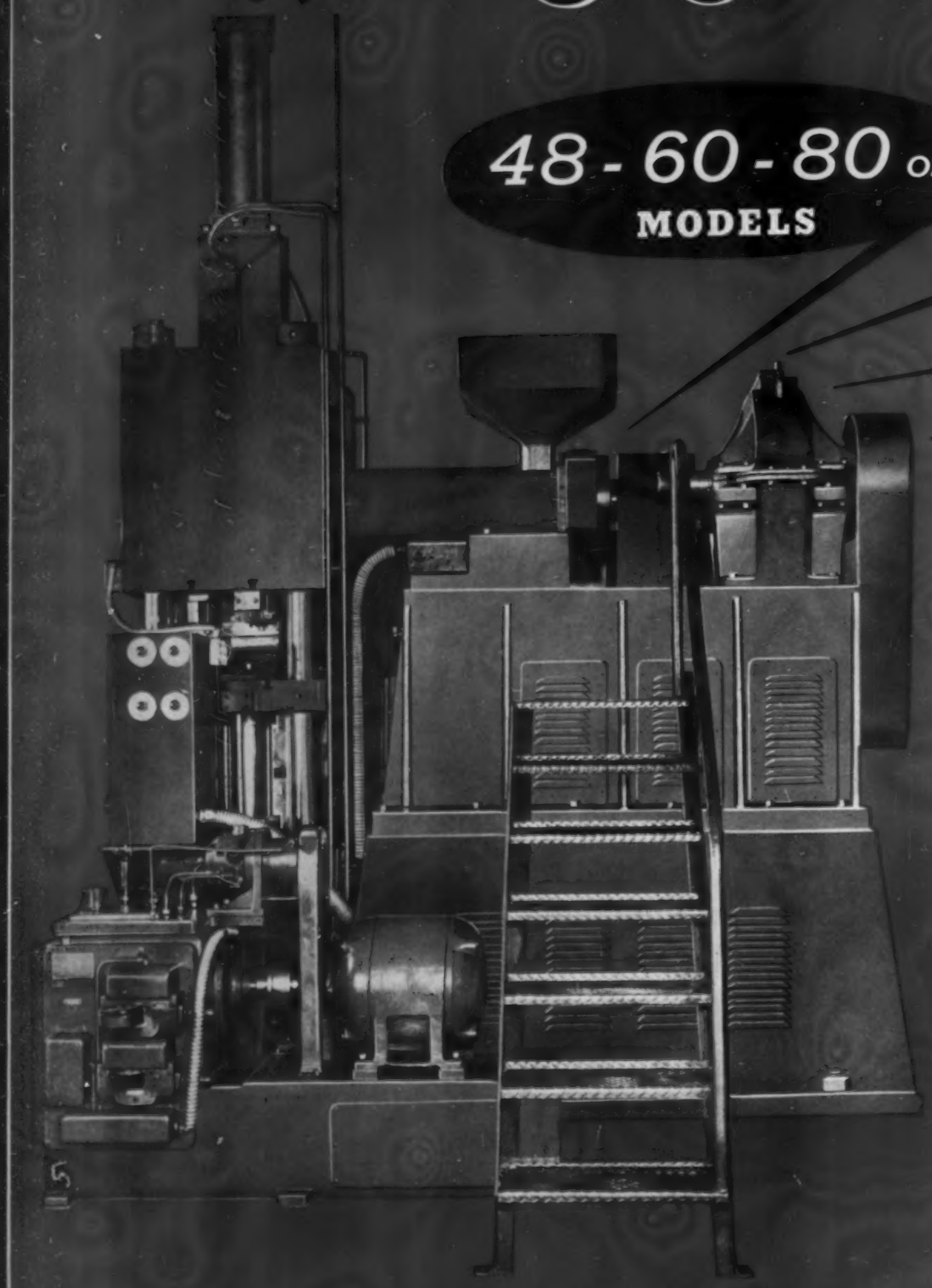
NIXON
CELLULOSIC PLASTICS

NIXON NITRATION WORKS • NIXON • NEW JERSEY

Representatives in Principal Cities • Chicago Office: 510 N. Dearborn Street, Chicago 10, Illinois
Canadian Distributors: CRYSTAL GLASS AND PLASTICS, LTD., Toronto, Can. • Export Distributors: OMNI PRODUCTS CORP., 460 4th Ave. N.Y. 16, N.Y.

NEW J-C PRESS

48 - 60 - 80 oz.
MODELS



MAKES SUPER-SIZE INJECTION MOLDINGS!

LOW OPERATING PRESSURES!

100% PLASTICIZATION!

EXTRA-FAST CYCLES!

Meet the spectacular J-C Press* . . . the all-new machine that mass-produces **extra-large, high quality** moldings at record speeds . . . and at unmatched economy per molded piece. And because it operates at amazingly **lower** pressures than other machines, the J-C Press is light in weight, low in price, small in size and tremendously cheaper to operate and maintain.

Here's the explanation . . . The J-C Press is a complete departure from conventional injection molding machine design. Look at the picture and you'll see that it is actually an extruder (below the hopper) and a vertical, transfer-type press — all in one! *The specially-built extruder does three jobs: 1—it heats, 2—it* ***completely and uniformly*** *plasticizes, and 3—it feeds the molding compound directly into the vertical torpedo-less injection chamber in* ***exact*** *one-shot doses—all automatically.* Due to this complete pre-plasticization, injection pressures are negligible. For example, on a 23-ounce shot of polystyrene we use 3100 psi as against 25,000 psi on a conventional machine. Locking pressures are low (often 300% to 400% less) and only small pumping units are required.

Thanks to this radical new design, the J-C Press operates on an uninterrupted high-speed schedule. Cycle succeeds cycle at rapid-fire tempo with automatic timers controlling each step in the entire press operation — plasticizing, feeding, injecting, clamping, cooling and opening. There's no downtime anywhere along the line.

And thanks to this same sensational design, *the J-C Press can be used not only for injection molding but for compression and transfer molding as well! Even the extruder can be put to separate use on regular extrusion runs!*

*Patents applied for

WRITE NOW FOR COMPLETE INFORMATION

The spectacular J-C Press opens up a new and virtually untapped market for large thermoplastic pieces throughout the industrial world. Act now to insure **your** position in the field by writing today for detailed specifications, prices and delivery dates on the model (43, 60, or 80-ounce) whose capacity fits your needs.

J-C

Jackson & Church

COMPANY

SAGINAW, MICHIGAN

WORK WELL DONE, SINCE 1[illegible]

Note the name well...

AMERAN resin paste

...a new PLASTISOL developed by American Anode for improved continuous application . . . dipping, coating or spreading

WHAT AMERAN RESIN PASTE CAN DO FOR YOU:

This new plastisol may be the long sought answer to your problems. It makes available to processors plastisol compounds that are free from air bubbles. It can be used to make coatings or flexible sheets — maintaining permanent lustre. No solvents; no fire hazard; no recovery problem. It can be compounded to give you the qualities you want — oil resistance, acid-resistance, chip proofness, full variety of fast colors, including white.

SOME OF THE PROFITABLE WAYS THIS NEW PLASTISOL MAY BE USED:

Ameran Resin Paste may be used easily and economically for coating metal and wire, wire baskets, plating racks, pipe linings, wood, textiles and paper. It can also be used for the manufacture of unsupported films and to make dipped gloves and other film applications. It has ready possibilities in casting or molding finished items, such as toys, gaskets and industrial boots. These uses may suggest even more to you.

American Anode engineers will gladly work with you in laboratory tests. They'll welcome an opportunity to study your present problems or products—help you find profitable uses and improvements with Ameran Resin Paste. For complete information about this new plastisol, please write Dept. AD-4, American Anode Inc., 60 Cherry Street, Akron, Ohio.

AMERICAN ANODE

CRUDE AND AMERICAN RUBBER LATICES, WATER CEMENTS AND SUSPENSIONS

Molded right for writing

Our molding assignment for these Alexander pencils was to produce writing instruments properly balanced—smooth of line. Color specifications were carefully met—functional needs of the product were painstakingly watched.

This careful consideration of functional needs characterizes our production activity. First we determine whether or not plastics can do the best job for you. Then we make sure *in advance*, that the plastic material used will be *right* for your product. Our engineers and molders now go to work and create a plastic product that is *right* every way you look at it. *Right* for appearance—*right* for stability—*right* for sales appeal.

We'd like to convince you in person that ours is the *right* molding service for you. Tell us about your plastic problems. You'll receive a speedy and, we believe, a helpful and profitable answer.

Write on your letterhead for the new injection Molded and Extruded Plastics catalogue. Or, for detailed information about [illegible]* pipe, tubing and fittings, write for circulars containing data and illustrations.

ELMER E. MILLS CORPORATION

INJECTION MOLDERS and EXTRUDERS of: Tenite, Lumarith, Plastacele, Fibestos, Lucite, Plexiglas, Nylon, Polystyrene, Styron, Lustron, Loalin, Vinylite, Geon, Plexene, Polyethylene, Cerex, Forticel, [illegible]*, Saran, and other Thermoplastic Materials.

2930 NORTH ASHLAND AVENUE • CHICAGO 13, ILLINOIS

NEW ADDRESS
NEW PLANT

MPc molded plastics *open the door* to cool profits

These friendly red beverage dispensers catch the coins of the thirsty wherever people gather. They are silent salesmen that operate strictly on their own! To stay in business they need to be *rugged* . . . need to operate perfectly over long periods without pampering. In building this unit for utmost dependability, The Vendo Company looks to **MPc** for two key parts . . . the door and the "eyelet" illustrated below.

Here is another case where product development got a valuable "assist" from molded plastics intelligently conceived . . . correctly engineered . . . ably manufactured. Submit *your* plastics product or problem to MOLDED PRODUCTS CORPORATION, 4535 W. Harrison St., Chicago 24, Illinois.

Door and Eyelet for Vending Machine made by THE VENDO COMPANY, Kansas City, Mo.

Molded plastics outranks all other materials for these parts . . . because high impact strength is combined with low thermal conductivity and dimensional stability. Assembly is simplified by ingenious mold design. All through holes are molded in, and cored bosses receive self-tapping screws and at the same time add strength. The door is attractively painted aluminum with red paint wiped into the molded-in trade mark lettering.

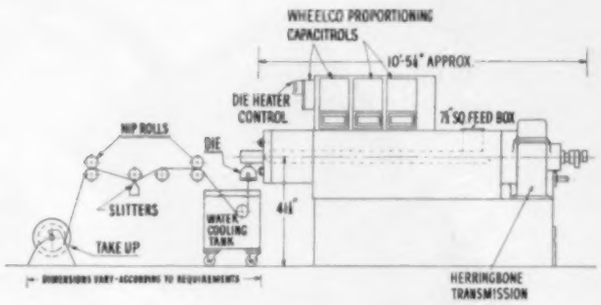
PLASTICS DIVISION
MOLDED MPc PRODUCTS
CORPORATION

This tough, transparent pouch-package for margarine is extruded Visten Film, a combination of Hycar American Rubber and vinyl resin.

World's finest film and sheeting for packaging

produced by NRM extruders

The NRM 4½" All-Electric Extruder equipped with T-type polyethylene die for the extrusion of 40" wide film, shown here, is designed for fast, efficient production of the larger cross-sections in materials with extremely high extruding temperatures. The unit has a capacity up to 300 lbs. per hour.



WITH the emphasis on thermo-plastics *extruded* materials for packaging purposes, NRM is serving the plastics industry all over the world, with a full line of extrusion equipment designed to meet the most exacting requirements in the production of thin-wall film and thin-gauge sheet.

If you've been waiting for a practical, *low-cost* method of thermo-plastics film or sheet production for use in packaging, contact us—today!

Visqueen clear film, produced with NRM Extrusion Equipment, displays attractive home products to best advantage.

Filling extruded Visqueen film-lined bag with powdered milk. In test, bag opened 9 months after sealing showed no trace of lumping.

NATIONAL RUBBER MACHINERY CO.
General Offices: AKRON 8, OHIO
Export Representative for Plastics Extrusion Equipment
OMNI Products Corporation, 460 Fourth Ave., New York 16, N. Y.

Plastics
MACHINERY DIVISION

DURITE

* UNIFORMITY
* RIGID SET
* FAST CURE
* DURABILITY
* GOOD MOLD RELEASE

These vital properties make Durite Phenolic Compounds ideally suited to the "Plunger" method of molding. Used by August C. Frank to produce a platform for construction builder, for J. Donald Biever Co., Phila.

THE BORDEN COMPANY

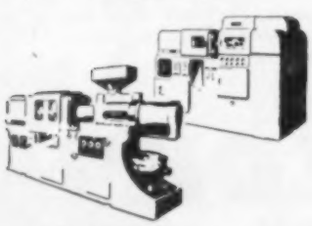
Chemical Division

5000 SUMMERDALE AVE., PHILA. 24, PA.

Stepped-up time cycling—a speeding-up that pays off in molding profits—is something you're bound to want to look into. The new-design Fellows-Leominster machines are just about the last word in high-speed-molding capacity. Fellows engineering is moving this line of Injection Molding equipment out in front. Every man in the market for 1949 equipment owes it to his pocket book to investigate—AND COMPARE!

Design Features that put money in the user's pocket.

- New automatic preheat of material, readies the shot for faster plasticizing.
- New clock-controlled booster for faster injection and better control.
- New built-in pyrometers for all-'round convenience.
- New super Speed-Flo cylinder design, with Taper-tite torpedo.
- New injection plunger pre-positioning to save half of injection time.
- and many other exclusive points of superiority.



Fellows LEOMINSTER injection molding equipment

WANT THE DETAILS ?

Sign below and let us send you the new catalog information

Name_____ Title_____

Company_____

What capacity most interested in?_____ oz._____

Street Address_____

City & State_____

THE FELLOWS GEAR SHAPER CO., Plastics Machine Div., Head Office & Export Dept., Springfield, Vt. Branch Offices: 616 Fisher Bldg., Detroit 2. 640 West Town Office Bldg., Chicago 12 • 7706 Empire State Bldg., New York 1 • New England Distributor: Leominster Tool Co., Leominster, Mass.

AUTOMATIC PLASTICS gives hat production a head start with a "BALDWIN"

How Baldwin Plunger Molding Presses help to turn *new ideas* into *profitable new products* was recently re-demonstrated at the plant of Automatic Plastic Molding Co., Emeryville, Cal., on a long run of "Hard-Boiled Hats". After extensive joint research and experiment by Automatic Plastic Molding and E. D. Bullard Co. (which markets the hat), cocoanut fiber impregnated with resin was successfully utilized as the material. The Baldwin press continuously maintained the high production rate required to produce the large initial order for introductory stocks.

Automatic Plastic Molding has pioneered in developing and producing a variety of high-requirement molding jobs, as is suggested by the illustrations of typical recent production. The portable insecticide vaporizer involved a draw of some 8½ inches, and required about 3½ pounds of material. Inserts were molded into the structure. Other items include a receptacle plug; a carving fork; a pan handle; and clips used in a permanent waving machine. Each of these clips has five small screw inserts in the back.

Baldwin Plunger Molding Presses offer the progressive plastics manufacturer maximum opportunities for fast, precise, profitable production. For a detailed description of the many advanced features of the Baldwin Molding press line, ask for Bulletin 251.

The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: Boston, Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis, Washington. In Canada: Baldwin Locomotive Works of Canada, Ltd., Toronto, Ontario.

BLW THE BALDWIN GROUP

BALDWIN

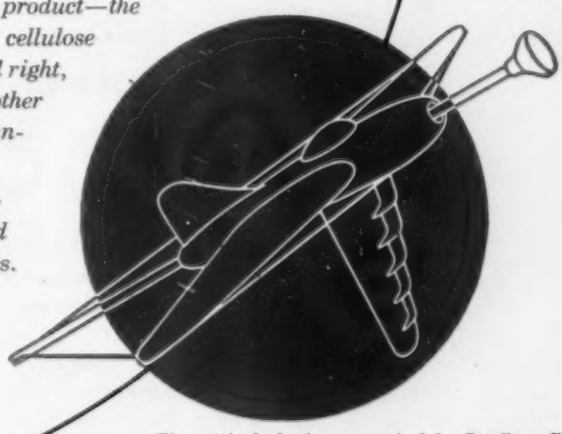
HYDRAULIC PRESSES

K-Jet, Kenton Plastics' version of the original sketch—an up-to-the-minute toy designed to appeal to modern youngsters

Designed Right . . . *it Sells on Sight!*

It started with a Hercules design sketch for a new and different toy. Collaboration of designer and manufacturer translated the original idea intact into an attractive, sales-compelling product—the K-Jet shooting toy, molded with tough, colorful cellulose acetate by Kenton Plastics Corporation. Designed right, with the proper plastic, it sells on sight . . . another example of the advantages of sound product planning with the versatile cellulosics.

You, too, will find that designing with the cellulosics can lead to broadened markets and increased sales. Our technical staff invites your inquiries.



The original sketch as conceived by Sundberg-Ferar

BEAUTY COLOR STYLING
TOUGHNESS LIGHTWEIGHT
MANUFACTURING ECONOMY

HERCULES POWDER COMPANY INCORPORATED *916 Market Street, Wilmington 99, Delaware* CP9-6

Do your pipe systems lack flexibility?

Here's an example of how

BARCO CAN PROVIDE IT

Every tire press in this assembly line is equipped with Barco Swivel Joints which provide the piping flexibility required to open and close the press.

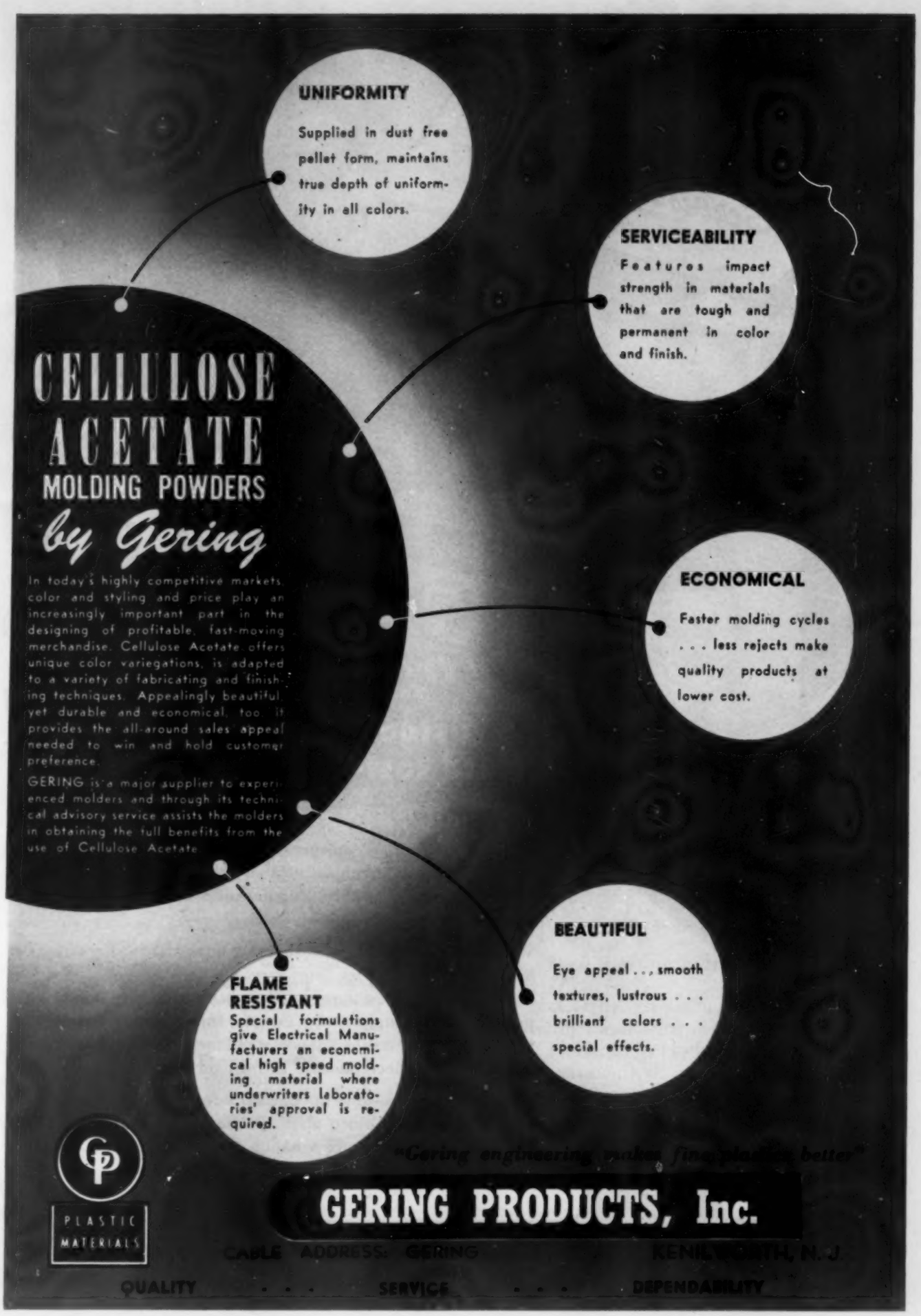
For over 30 years Barco Joints have been serving industry and transportation—each year becoming more and more popular. Today, they are used in almost every kind of job requiring *flexible* fluid-conveying systems. By absorbing strain and stress, by compensating for expansion and contraction, Barco Joints have long been practically indispensable. Write for full information to Barco Manufacturing Company, 1809 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO FLEXIBLE JOINTS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Not just a swivel joint ...but a combination of a swivel and ball joint with rotary motion and responsive movement through every angle.

"MOVE IN EVERY DIRECTION"


UNIFORMITY
Supplied in dust free pellet form, maintains true depth of uniformity in all colors.
SERVICEABILITY
Features impact strength in materials that are tough and permanent in color and finish.
CELLULOSE ACETATE
MOLDING POWDERS
by Gering
In today's highly competitive markets, color and styling and price play an increasingly important part in the designing of profitable, fast-moving merchandise. Cellulose Acetate offers unique color variegations, is adapted to a variety of fabricating and finishing techniques. Appealingly beautiful, yet durable and economical, too, it provides the all-around sales appeal needed to win and hold customer preference.
GERING is a major supplier to experienced molders and through its technical advisory service assists the molders in obtaining the full benefits from the use of Cellulose Acetate.
ECONOMICAL
Faster molding cycles . . . less rejects make quality products at lower cost.
BEAUTIFUL
Eye appeal . . . smooth textures, lustrous . . . brilliant colors . . . special effects.
FLAME RESISTANT
Special formulations give Electrical Manufacturers an economical high speed molding material where underwriters laboratories' approval is required.
PLASTIC MATERIALS
"Gering engineering makes fine plastics better"
GERING PRODUCTS, Inc.
CABLE ADDRESS: GERING
KENILWORTH, N. J.
QUALITY . . . SERVICE . . . DEPENDABILITY

. . . custom-molded plastics afford cost-cutting advantages

Distinctive styling . . . proper physical characteristics . . . unsurpassed quality . . . nominal cost . . . these are but a few of the reasons why many leading manufacturers use handles which are custom-molded by General Industries.

With custom-molded handles there are no restricting limitations to hinder design engineers. Every service requirement of the finished product can be taken into careful consideration, with the handles produced accordingly. And at General Industries, advanced molding techniques, plus the latest types of molding equipment, make it possible to effect valuable savings on large quantity orders.

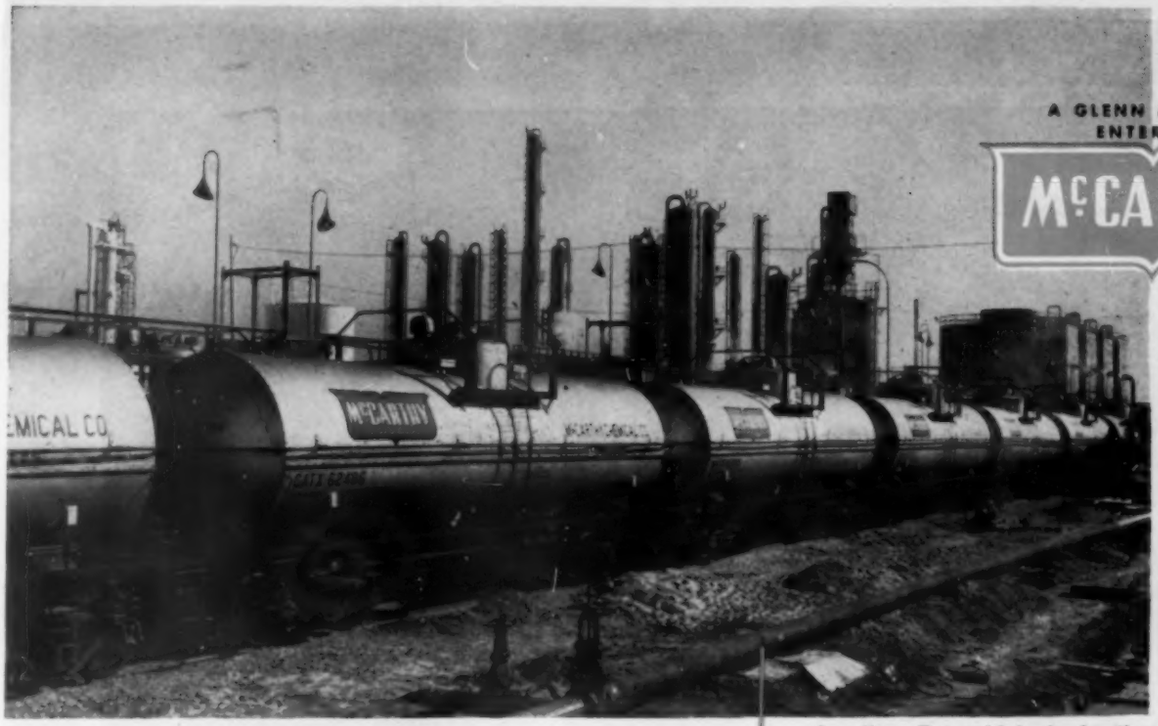
General Industries—one of America's foremost and largest producers of custom-molded plastics—offers you a confidential *Cost-check* engineering service without cost or obligation. For complete information, write today to:

The GENERAL INDUSTRIES Co.

DEPARTMENT R • ELYRIA, OHIO

A GLENN McCARTHY ENTERPRISE

McCARTHY



Loading Formaldehyde in the 10,000 gallon tank cars operated by McCarthy. Each car is especially lined and insulated.

Time to Talk '50 with McCarthy

Chemical process industries are planning ahead, checking 1950 contract needs, looking to the McCarthy Chemical Company to meet those requirements from the predictable volumes of primary and intermediate chemicals flowing today from the new McCarthy unit at Winnie, Texas.

Assured supplies of petro-chemicals are made possible by the unique McCarthy "flow-chart" — a production cycle that begins and ends with McCarthy-owned and operated facilities and resources that provide unlimited reserves of natural gas, a supervised gathering system and the fully controlled processing of hydrocarbons.

From well to market, this steady and uninterrupted flow of raw materials for plastics, dyes, explosives, paints and other chemical applications is helping meet today's demands efficiently, economically, promptly.

Now it's time to talk '50 with McCarthy. Look to McCarthy Chemical Company for your 1950 contract requirements—consult McCarthy about your needs. Write, wire or call today.

- **37% Inhibited Formaldehyde**
- **37% Uninhibited Formaldehyde**
- **Methanol**
- **Propane**
- **Acetaldehyde**
- **Fuel Oils**
- **Butane**
- **Gasoline**
- **Kerosene**

New Horizons in Hydrocarbons

McCarthy producing companies are planning ahead with industry, exploring New Horizons in Hydrocarbons through more economical, more efficient processes, conserving more and more of our valuable natural resources by converting yesterday's wastes into today's valuable raw materials.

McCARTHY CHEMICAL COMPANY

SHELL BUILDING — HOUSTON, TEXAS TELETYPE NO. 181 PHONE: PRESTON 7204

Take the easy, low-cost way to give your product the full protection of polyethylene. Use flexible, seamless Plaxpak Layflat tubing. It saves wrapping motion, wrapping time, and makes a better package. There are no corners to catch and no difficult folds to seal. The product is inserted, not enfolded. Layflat tubing comes plain or gusseted. Plax supplies it in continuous rolls, but it can be obtained from your regular converter in the form of bags, envelopes and pouches.

PLAX
FOR PLASTIC SHEET, ROD & TUBES
NOT SUBSTITUTES ··· IMPROVEMENTS

PLAX CORPORATION DIVISION, HARTFORD-EMPIRE CO.
P. O. BOX 1019 ★ HARTFORD 1, CONNECTICUT
In Canada — Canadian Industries, Ltd., Montreal

"BETTER ASSEMBLY for Half the Cost"

REPORTS **Lovell** WORLD'S LARGEST MANUFACTURERS OF WRINGERS
Erie, Pennsylvania

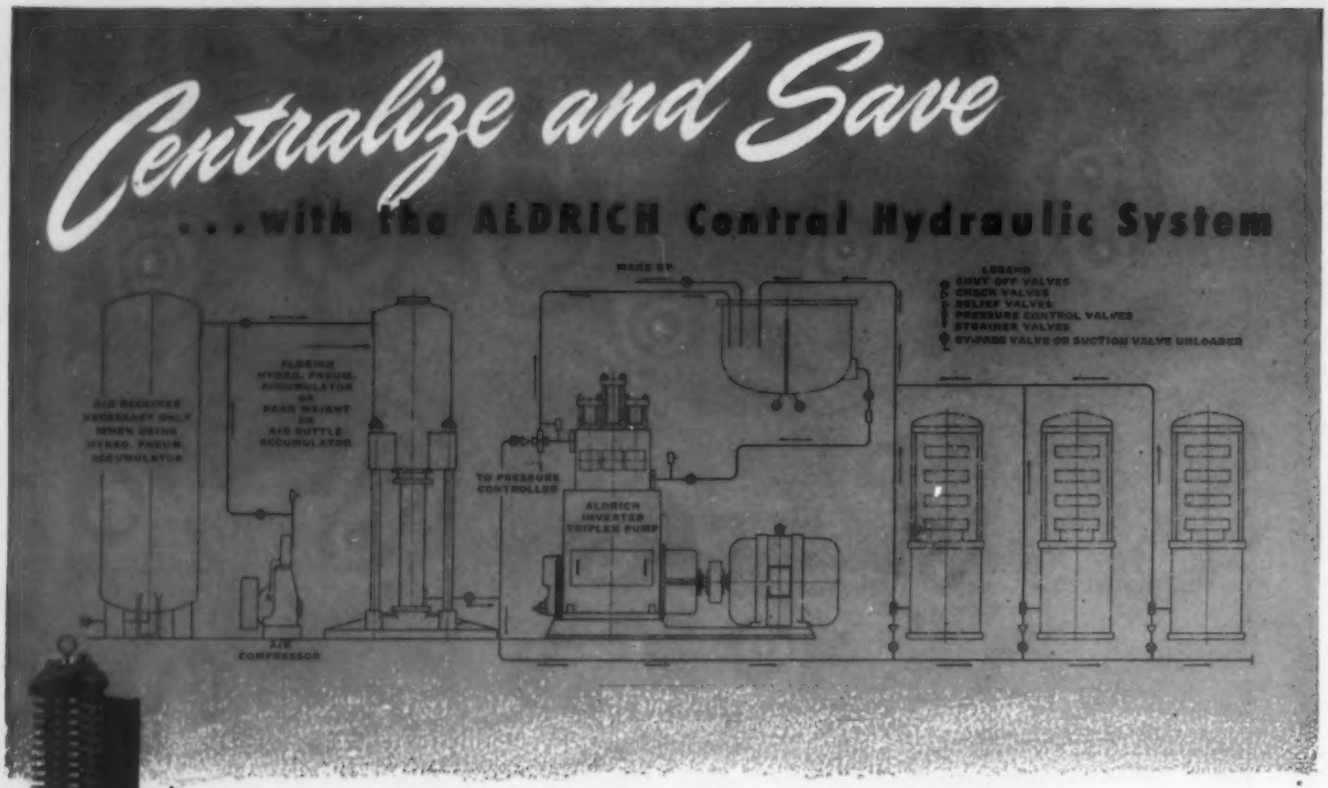
"We first considered the use of a grooved shaft and a drop-in pin as the best method of applying a plastic knob to the Lovellette wringer handle," states Mr. W. L. Kauffman, Chief Engineer of Lovell Manufacturing Co. "We found, however, that the easy attachment and secure locking provided by Tinnerman SPEED NUTS made a better assembly. We were also pleased to discover that the SPEED NUT assembly cost was about one-half as much as the other method considered!"

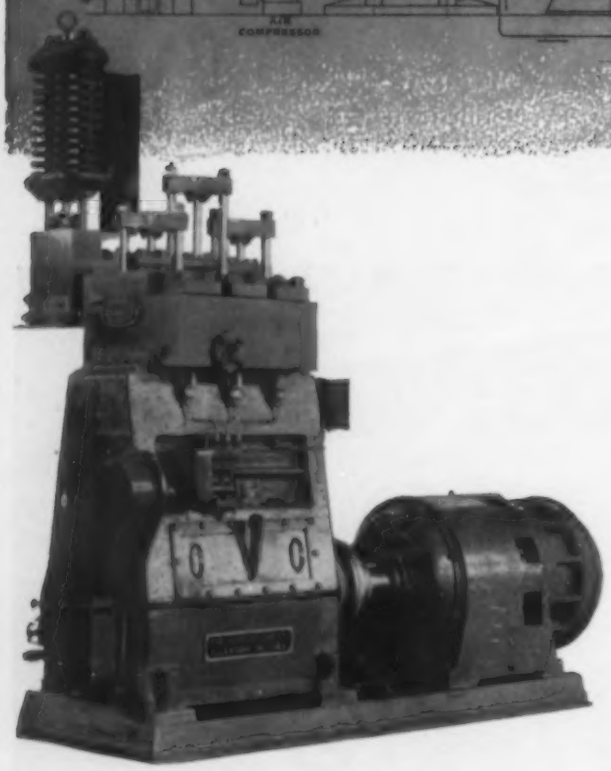
This 50% saving is another positive demonstration of the cost-reducing, product-improving qualities of the SPEED NUT brand of fasteners. To learn how effectively SPEED NUT assembly advantages can be adapted to your product, call in your Tinnerman representative—he's listed in major city phone directories. TINNERMAN PRODUCTS, INC., 2040 Fulton Road, Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.

Diagram below shows how Push-On Type SPEED NUT receives shaft of wringer handle. Prongs of SPEED NUT "bite" into shaft, securely locking knob in position.
After SPEED NUT is positioned in cavity of knob cap, the two sections are sealed together with acetone. Then knob is easily pushed on wringer handle. Knob molded by Perry Plastics, Inc., Erie, Pa.
TINNERMAN Speed Nuts
Trade Mark Reg. U. S. Pat. Off.
FASTEST THING IN FASTENINGS

Centralize and Save

. . . with the ALDRICH Central Hydraulic System





The Aldrich Inverted Triplex Pump

For operation of hydraulic presses—a single, concentrated source of hydraulic power is good engineering economics. Just as a central power station most efficiently and economically serves an entire community—so can the Aldrich Central Hydraulic System serve your presses.

Centralization saves. Present Aldrich installations in plastic molding and record pressing plants prove this. You save through less waste energy, more efficient production of power, quick accessibility, minimum machinery, less maintenance and repair, less time wasted.

The heart of the Aldrich System is the Aldrich Pump. Either the Aldrich Inverted Triplex or the Aldrich-Groff "POWR-SAVR" Controllable Capacity Pump can be used. The Aldrich Inverted Triplex, a constant stroke, constant speed pump, ranges in power from 10 to 300 HP and may be coupled directly or through speed-reducers to a driver located on the floor—saving space and foundation costs. The "POWR-SAVR", a variable stroke pump, provides stepless, automatic control of delivery. And delivery is in almost direct proportion to demand—saving power.

Whatever your job may be, if you use several presses—check with our engineers on the Aldrich Central Hydraulic System.

Representatives: Birmingham • Bolivar, N. Y. Boston • Chicago • Cincinnati • Cleveland Denver • Detroit • Duluth • Houston Jacksonville • Los Angeles • New York • Omaha Philadelphia • Pittsburgh • Portland, Ore. Richmond, Va. • St. Louis • San Francisco Seattle • Spokane, Wash. • Syracuse • Tulsa

THE ALDRICH PUMP COMPANY

6 GORDON STREET, ALLENTOWN, PENNSYLVANIA

The **FIRST** *Name in Reciprocating Pumps*

BUILDING A

Bigger Future

FOR COMPRESSION MOLDING

PLENCO

PLASTICS ENGINEERING CO.

PLUS

MPc

MOLDED PRODUCTS CORPORATION

EQUALS

SIZE: 32¼" high, 16¾" wide, 18" deep.
Weight: 35 pounds.

Never till now has compression molding produced anything approaching the size of this Admiral television console. Its successful production . . . by MPc using **PLENCO** phenolics . . . will spark the thinking of design engineers and executives toward much wider use of molded plastics . . . toward ever finer quality at lower cost.

Plastics Engineering Co. was in at the start of this pace-making project. We developed for the Molded Products Corporation a modified phenolic to meet the exceptional requirements of this huge casting with its great bulk, large areas and deep draw. And now large scale production by MPc *with practically no losses* demonstrates the excellence of **PLENCO** phenolics . . . shows how uniformity of characteristics is accurately maintained from batch to batch.

Modifying standard phenolics is a specialty with us. Our "engineering minded" staff, with practical molding experience, is ably qualified to render this service. Ample plant capacity enables us to give prompt "custom" delivery on all special or standard phenolics. Write us about your requirements.

PLASTICS ENGINEERING CO.
SHEBOYGAN, WISCONSIN

PLENCO **PHENOLICS** ...*black, browns, mottles and colors* in General Purpose, Heat resisting, and Medium Impact grades. Special Purpose Molding Compounds and Resins are produced to fulfill special molding requirements.

When It's Grinding or Pulverizing

STURTEVANT EQUIPMENT

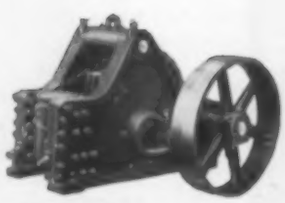
DOES THE JOB FAST!

Whether you grind soft or hard materials, there is a Sturtevant Grinder or crusher exactly suited to your requirements.

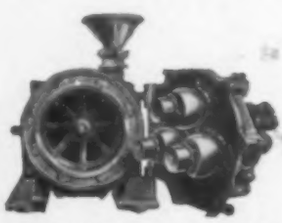
Tough and rugged, Sturtevant Equipment has the built-in stamina to stand up under continuous operation. Most of this equipment has the "open door" accessibility which makes cleaning easy.

Look into Sturtevant Grinders and crushers for your applications. These machines will give you the exact mesh you want . . . cut your costs by increasing production. Write for catalog today.

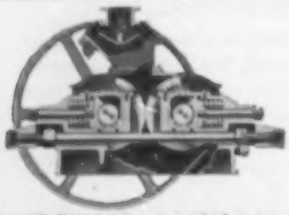
ROTARY FINE CRUSHERS for intermediate and fine reduction (down to ¼"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



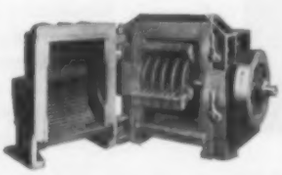
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 38 x 20. The standard for abrasives.



SWING-SLEDGE MILLS for coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

MOTO-VIBRO SCREENS screen anything screenable. Classified vibrations. Unit construction—any capacity. Open door accessibility. Open and closed models with or without feeders. Many types and sizes—range of work ½" to 60 mesh.

STURTEVANT MILL COMPANY

110 CLAYTON STREET, BOSTON 22, MASS.

DESIGNERS & MANUFACTURERS OF DENS AND EXCAVATORS • MIXERS • SCREENS • PULVERIZERS • ELEVATORS • AND COMPLETE FERTILIZER UNITS

The Package is Part of the Product . . .

CORTLAND LINE COMPANY Packs Its Bait Casting Line in a Handsome Permanent Container . . .

custom molded by ERIE RESISTOR

The transparent polystyrene case which holds two 50 yard reels of Cortland "Dri-Seald" Bait Casting Line makes a perfect display, and adds to sales appeal because it serves as an ideal container for the line, or for other tackle of the fisherman's art.

Erie Resistor solved the production problem by combining practical mold design with timing and temperature control, to avoid corner cracks and scoring, and accomplish an economical output of perfect pieces.

As the pioneer in custom injection molding, Erie Resistor has had long experience in solving the problems that require an intimate knowledge of materials and their behavior, and a practical know-how of molding techniques. It will pay you to bring your plastic problems to Erie Resistor.

Plastics Division

ERIE RESISTOR CORP., ERIE, PA.

LONDON, ENGLAND • • TORONTO, CANADA

want to bowl a "strike" in SALES?

THERE WAS A TIME when only the very, very rich could afford salad bowls that looked anything at all like the one illustrated above.

Today, millions of homes can afford gorgeous table-ware that rivals the most expensive crystal—thanks to Columbia's creative and engineering know-how, and extensive facilities for producing plastic products in mass volume.

The flawlessly molded salad bowl set you see here is just one item among scores of fast-selling plastic products designed and produced by Columbia.

If you want the finest in custom molding service—for plastic products in great volume—at a sensible price—it will pay you to talk over your problem with Columbia.

COLUMBIA PROTEKTOSITE COMPANY, INC., CARLSTADT, NEW JERSEY

New York Showrooms: Empire State Building

Columbia

COLUMBIA 25th ANNIVERSARY

THEY *ALL* AGREE! . . .

Ferro pigments* are highly stable, heat and light-fast ...*produce permanent colors

- MANUFACTURERS OF PLASTIC MATERIALS
- EXTRUDERS
- CALENDERERS
- COATERS
- FABRICATORS
- MOLDERS

Ferro's inorganic colors are acclaimed by the entire plastics industry, *as having the greatest combination of desired coloring properties!* Highly stable, particularly in temperatures up to 2300°F, *Ferro pigments* are easy to work and have an unusually low bulking value. Electrical and chemical-resistant, these uniform colors are light-fast . . . are not affected by weather extremes . . . are nonbleeding and nonmigrating.

If you are not satisfied with your present colors we suggest that you try *Ferro pigments* in your formulations. You'll find we have a wide range of colors that diffuse smoothly with a uniform intensity on which you can depend. Drop us a note, we'll be happy to send you whatever additional information you might require regarding our color service, or a representative will call at your request.

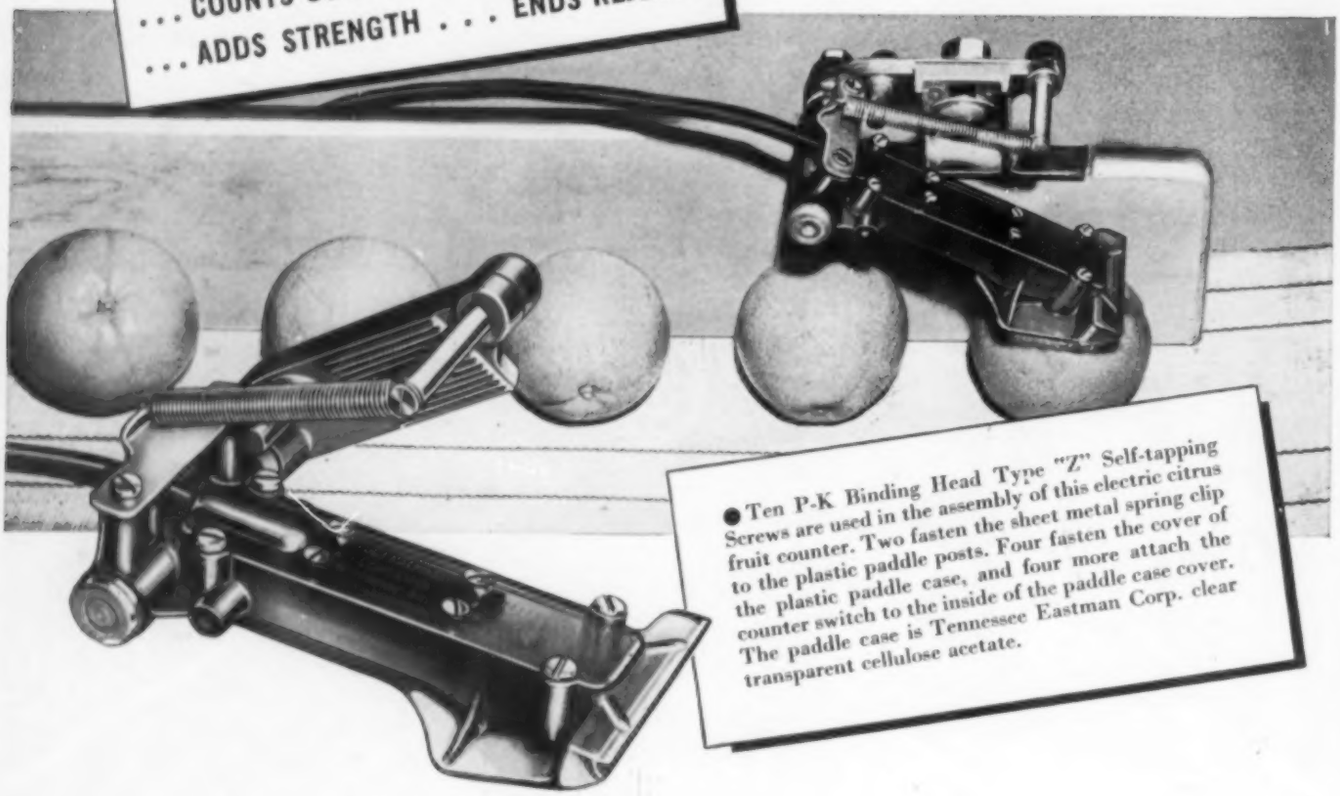
FERRO Enamel Corporation **Color Division**

4150 East 56th St., Cleveland 5, Ohio

COMMON SENSE ASSEMBLY ENGINEERING

Makes "impractical device" ... practical

... COUNTS OUT 10 TAPPING OPERATIONS
... ADDS STRENGTH ... ENDS REJECTS



● Ten P-K Binding Head Type "Z" Self-tapping Screws are used in the assembly of this electric citrus fruit counter. Two fasten the sheet metal spring clip to the plastic paddle posts. Four fasten the cover of the plastic paddle case, and four more attach the counter switch to the inside of the paddle case cover. The paddle case is Tennessee Eastman Corp. clear transparent cellulose acetate.

"This entire unit would have been impractical without P-K Self-tapping Screws" says **Food Machinery Corporation,** who make this electric citrus fruit counter to speed the packing of oranges after they have been sized.

With machine screws, costly, work-slowing difficulties were experienced in the assembly of the plastic and metal parts. Rejects ran high when holes had to be tapped, and often the device failed when screws pulled out during the counting of as many as 50,000 oranges daily.

By switching to P-K Self-tapping Screws, these problems were quickly overcome. Ten tapping operations were eliminated . . . rejects were a thing of the past. In the words of the manufacturer, "P-K Self-tapping Screws have much better holding qualities . . . gave the counter the trouble-free sturdiness it needed."

Why not gain the benefits of common sense engineering in your product assembly? Question every fastening in your product. Find out if tapping and mold-slowing inserts can be avoided, and product design simplified, by the simpler P-K method.

Call in a P-K Assembly Engineer. In seven out of ten cases, he can demonstrate that P-K Self-tapping Screws will save up to 50% in assembly work hours. If you prefer, mail assembly details for recommendations. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

Sold Only Through Accredited Distributors

P-K® The Original

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

PARKER-KALON SELF-TAPPING SCREWS

PARKER-KALON PRODUCTS COLD-FORGED SOCKET SCREWS, WING NUTS, THUMB SCREWS • HARDENED SCREWNAILS AND MASONRY NAILS SHUR-GRIP FILE AND SOLDER IRON HANDLES • METAL PUNCHES • DAMPER REGULATORS AND ACCESSORIES

. . . the Navy's Famed *Banshee* is equipped with L. P.* Parts by ZENITH!

● The Navy's spectacular McDonnell F2H-1 BANSHEE, the world's first service type fighter with an initial rate of climb of 9,000 feet per minute, is powered with two turbo-jets that make it one of the country's most powerful carrier based planes.

And from stem to stern — from nose to tail assembly — ZENITH L.P.* parts have contributed to its strength, lightness, speed and amazing maneuverability.

Zenith Plastics leads in low-pressure lamination — especially in the aircraft industry — because in plant, procedure and special equipment it is specifically and scientifically designed for L.P.* production with speed, precision and surprising economy.

If L.P.* is applicable to *your* industry, find out what ZENITH can do for YOU — today!

OTHER PRODUCTS IN L. P.*

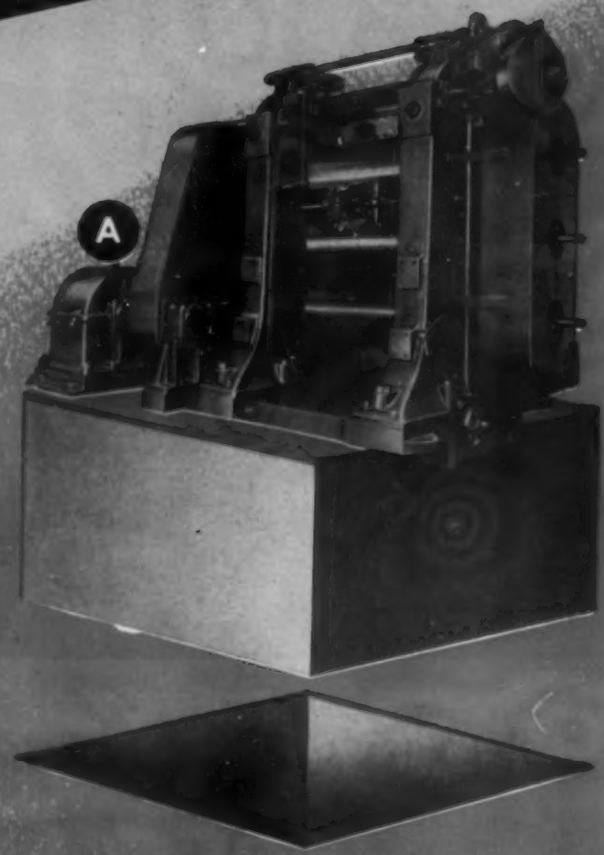
Building panels, containers, housings, cases of all types, refrigeration, automobile and truck components — wherever a strong, tough, low-cost, moldable material is called for.

ZENITH PLASTICS CO.

1548 W. 135th St. · Gardena, California · Plymouth 4-2934

L.P.* LOW PRESSURE LAMINATION

THESE CALENDERS WERE designed to plug holes IN PROCESSING EFFICIENCY



Farrel-Birmingham has maintained close contact with rubber and plastics processors since the earliest days of these two industries. The intimate knowledge gained through these relationships, combined with continuous technical research, has enabled the company to develop products which have kept pace with, or even anticipated, the changing needs of these industries.

The four calenders illustrated here are good examples of this pioneering policy. Each was designed to fill a real need—to plug a hole in processing efficiency.

Write for further information about calenders or any of the other equipment listed.

A 24" x 48" three-roll calender designed with substantial proportions and ample weight to withstand the severe service encountered in calendering stiff mechanical goods stocks. Housings, journal boxes and other parts are the same as would ordinarily be used for a 24" x 68" calender. Housings are of the arch type, of heavy box section, made of Meehanite* metal, a processed cast iron of superior physical properties.

B Designed for production that demands extremely accurate gauge and temperature control, the Farrel-Birmingham Z-type calender has a number of outstanding advantages: (1) Vertical pressure from a third roll cannot affect roll settings; (2) exposure of material in initial passes limited to a 90° arc of roll surface; (3) positive roll positioning provided by hydraulic pullbacks; (4) a built-in device which provides means for crossing the roll axes to compensate for deflection.

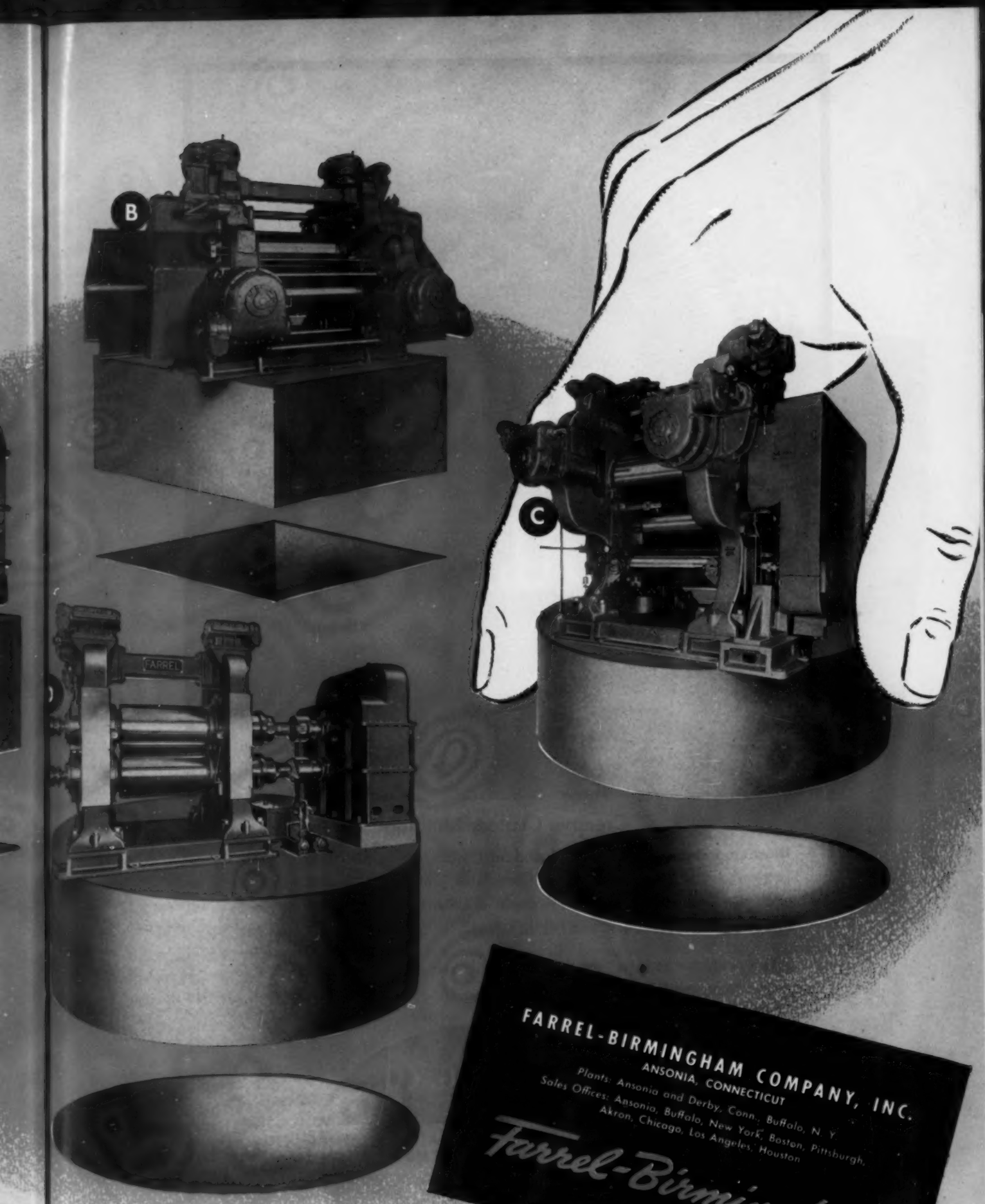
C In this four-roll plastics calender adjustment of the top, bottom and side rolls is by separate motor driving each screw through high ratio reduction worm gear units. Control is by push button; either end of a roll may be adjusted separately or both ends together. Opposite the bottom roll is a forged steel embossing roll equipped with air cylinders, valves and piping to provide pressure against the bottom roll.

D This 30" x 54" two-roll calender is specially designed for processing asphalt tile, with a variable speed range from 12 to 100 feet per minute, with even motion or friction between the rolls as desired. Adjustment of the top roll is motor-operated, with push-button control for adjusting either roll end independently or both together. A feature of this calender is the unit containing the drive and connecting gears, which are enclosed in a separate, fabricated steel housing. Rolls are connected to the gear stand by heavy, smooth-operating universals.

F-B* PRODUCTION UNITS

- Banbury Mixers
- Plasticators
- Pelletizers
- Mixing, Grinding, Warming and Sheeting Mills
- Bale Cutters
- Tubing Machines
- Refiners
- Crackers
- Washers
- Calenders
- Hose Machines
- Hydraulic Presses
- And Other Equipment for Processing Rubber and Plastic Materials

** Registered Trade-marks*

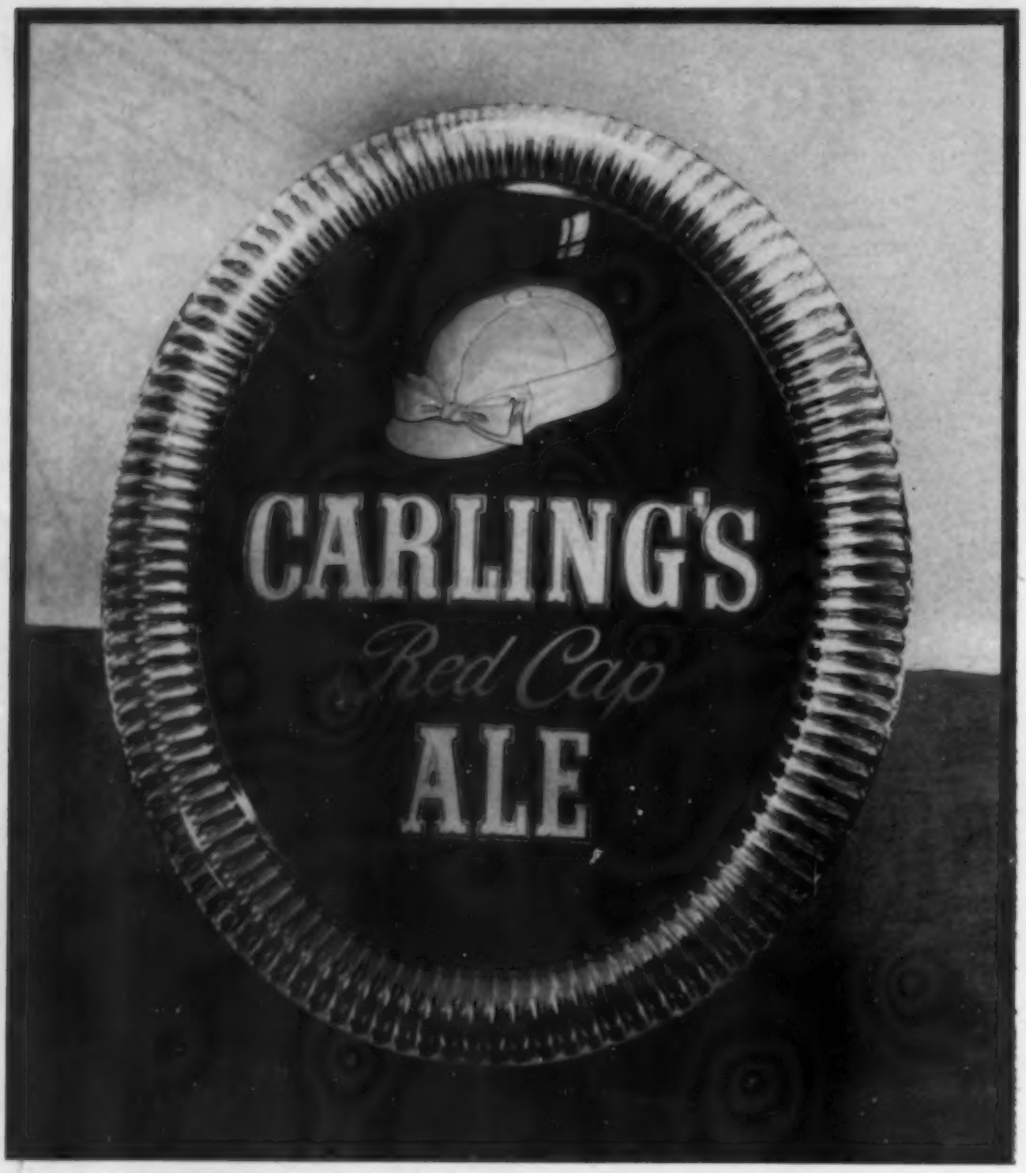


FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn.; Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham *



Creative Custom Molding

Illustrated above is a sign produced for Carling's Ale, distributed by The Brewing Corporation of America, Cleveland, Ohio. This injection molded sign measures 12"x9-7/8". It is made of acrylic material and finished in three colors -- red, green, and bright silver.

"The customer reports that this sign has been an effective point of sale advertising medium."

CRUVER MFG. CO.
Est. 1896

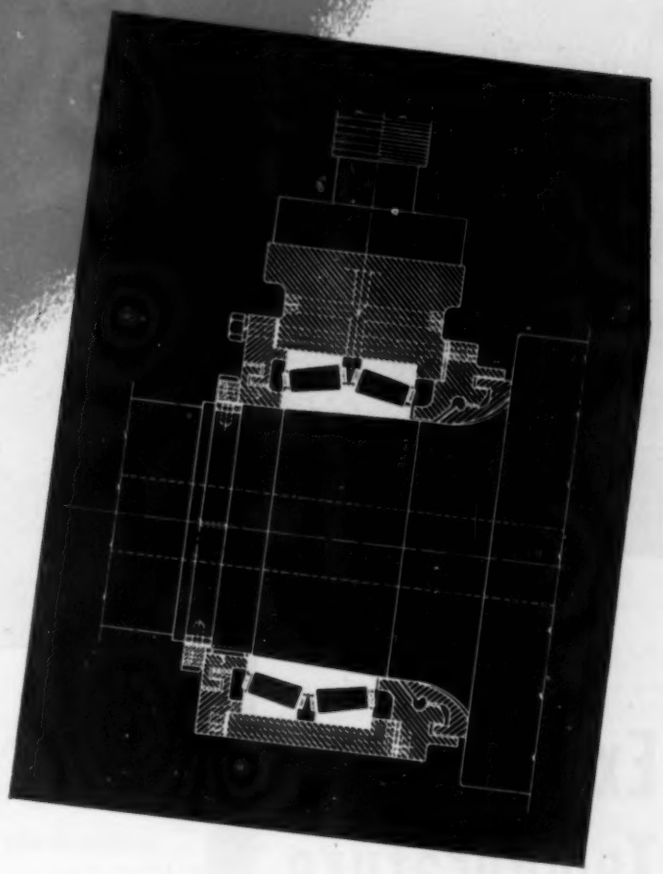
MOLDING • FABRICATING • LAMINATING • FINISHING
"BAS-RELEEF" • DECORATING • ASSEMBLY • SPRAYING

2460 WEST JACKSON BLVD., CHICAGO 12, ILLINOIS
NEW YORK 2 West 46th Street
DETROIT General Motors Building
ST. LOUIS Cotton Belt Building

HOW TO OBTAIN GREATER

Rigidity and Accuracy

IN PLASTICS CALENDERS



The essence of accuracy in plastics calenders is close and constant control of the predetermined gauge of the product throughout its width and length.

This demands maximum roll rigidity—minimum bearing runout—and minimum roll deflection under all load and temperature conditions.

By making possible (a) maximum roll neck diameter and strength (b) maximum radial, thrust and combined load capacity, Timken DIT type balanced proportion bearings as shown in the drawing, help provide the rigidity and endurance necessary for dependable, precision performance.

In addition, Timken bearings enable extremely fine adjustments to be made during installation, thus assuring minimum vertical movement of the calender rolls regardless of operating temperature.

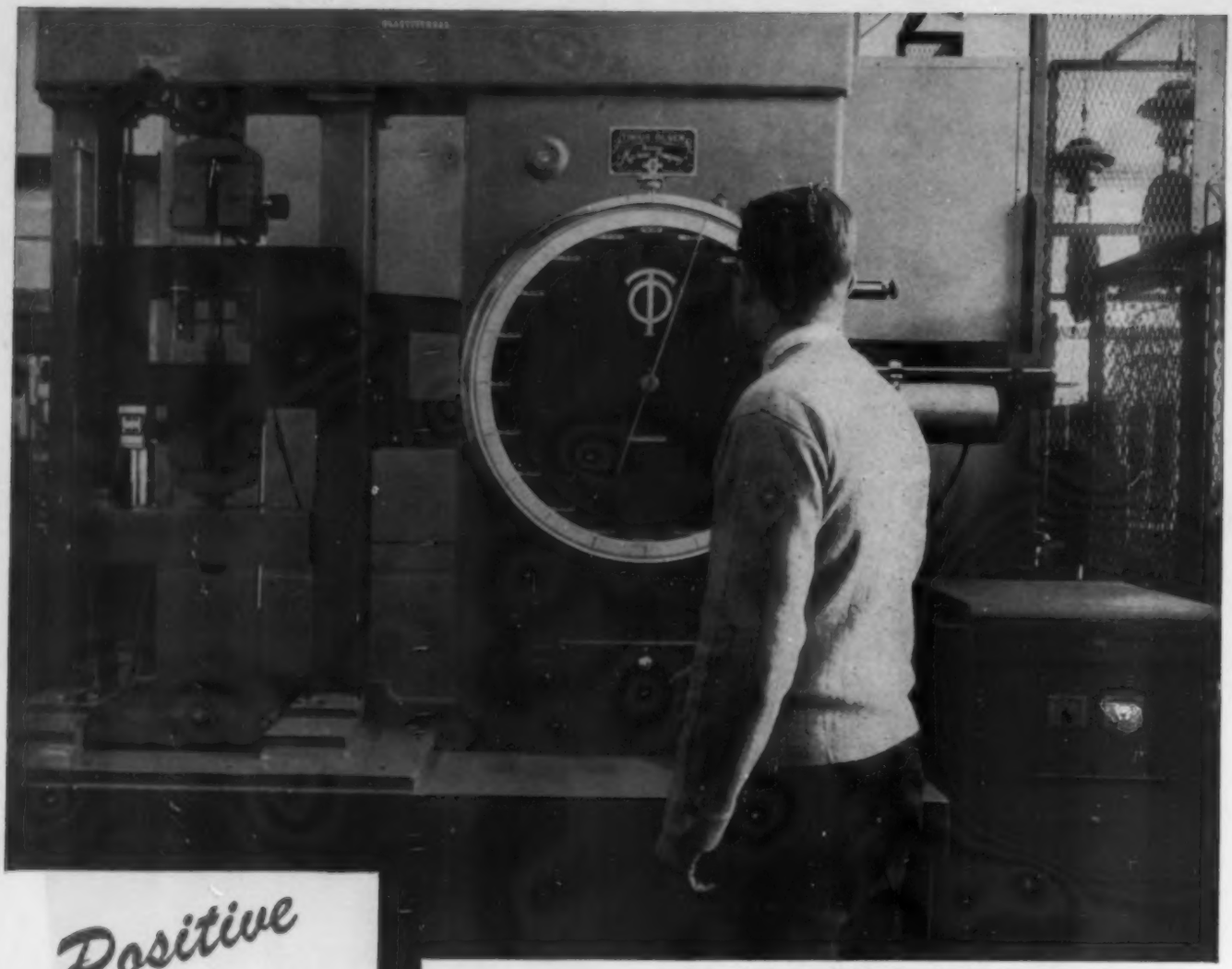
The Timken bearings furnished for these calender roll mountings are of the precision type. Calender rolls may be refinished when necessary while supported on their bearings. Inaccuracies in the O.D. of the roll necks or roll barrels are compensated for by the precision of the bearings themselves.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

To make sure of getting all these advantages in your calenders make sure the trade-mark "TIMKEN" appears on every bearing you use.

THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO · CABLE ADDRESS "TIMROSCO"

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ⟷ LOADS OR ANY COMBINATION ✳



Olsen Plastiversal with Electronic High Magnification Recorder.
Courtesy of the Bakelite Corporation, Bound Brook, New Jersey

Positive

Extreme Temperature Tests

with the

OLSEN PLASTIVERSAL

The Olsen Plastiversal Testing Machine equipped with the Olsen High Magnification Recorder, produces in chart form, accurate stress-strain curves for each test run. The specimen may be placed in a temperature controlled cabinet and, whether testing for tension, compression or flexure, the Extensometer records each physical change for the complete range of temperatures.

For dependability, high accuracy and ease of operation the Olsen Plastiversal is an invaluable aid in the comparison, standardization, control and development of plastic materials.

You are invited to write for complete information.

TINIUS OLSEN

Testing & Balancing Machines

TINIUS OLSEN TESTING MACHINE CO.

2050 EASTON ROAD, WILLOW GROVE, PA.

Representatives:

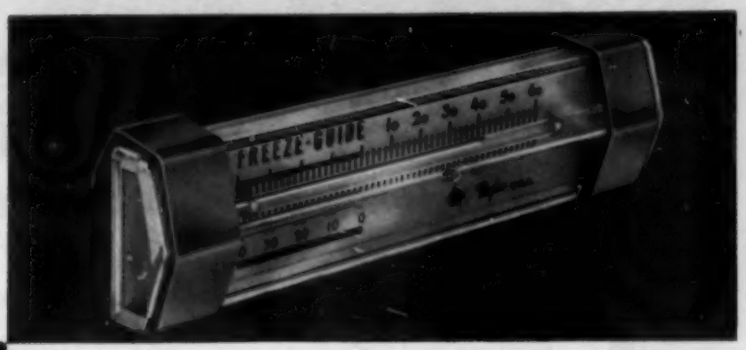
Pacific Scientific Co., Los Angeles, San Francisco, Seattle • Mine Smelter Supply Co., Denver, Colo.

VISIT THE METAL SHOW — OCT. 17th TO 21st — BOOTH 1830, CLEVELAND, OHIO

Freeze-Guide made by Taylor Instrument Co., Rochester, N. Y. Plastic case of Koppers Polystyrene molded by Michigan Plastics, Dexter, Michigan.

WANTED—

A PLASTIC WITH EXCEPTIONAL CLARITY



they got it with Koppers Polystyrene

● This neat little refrigerator thermometer, the Taylor "Freeze-Guide," shows how to solve a problem in product design. The manufacturer was interested not only in developing a better refrigerator thermometer, but he wanted one that would sell at low cost and would have a strong appeal to women.

The first problem was to produce a plastic case with exceptional clarity—equal to glass. This was solved with Koppers Polystyrene—and the molder reports excellent results.

Polystyrene also met the requirement of low cost and added the plus values of less breakage in manufacture and lighter weight for shipping.

To be sure the thermometer appealed to women, they pre-tested it with a number of other models, in a consumer panel of 500 women. The Taylor "Freeze-Guide" won decisively.

What properties do you need in a plastic?

Koppers makes Polystyrene in three types—*Polystyrene* 8, the high heat-distortion type for use where products must withstand scalding water or the intense heat of a radio power tube; *Polystyrene* 7, the intermediate heat-distortion temperature type, adaptable to a wide variety of molding applications; *Polystyrene* 3, the general-purpose type, for mass production and easy moldability in difficult molding jobs where conventional heat-distortion temperature is desired.

All come in transparent or a variety of colors. For quality polystyrene products—use Koppers Polystyrene.

KOPPERS COMPANY, INC.
Chemical Division **Pittsburgh 19, Pa.**
Regional offices: New York, Boston, Chicago and San Francisco

KOPPERS

Koppers *Perfected* **Plastics**

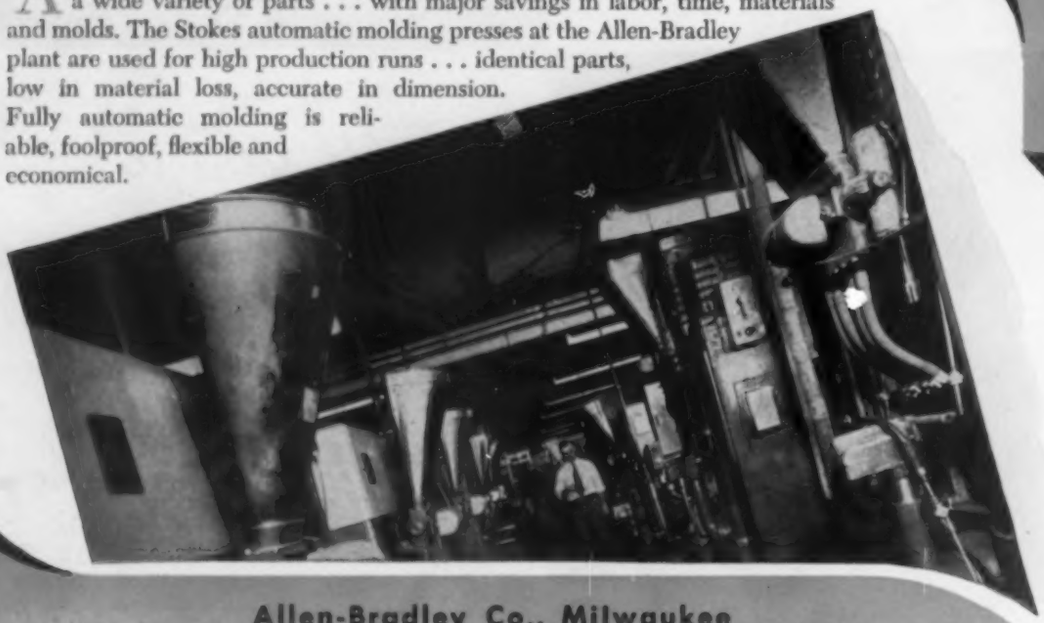
Koppers Company, Inc.
Chemical Division, Dept. MP-8
Pittsburgh 19, Pa.
Please send me data on Koppers Perfected Plastics.
Name_____
Position_____
Company_____
Address_____

*POLYSTYRENE *ETHYL CELLULOSE *CELLULOSE ACETATE

ASK STOKES

Costs ARE Reduced by Automatic Molding

AT ALLEN-BRADLEY, Milwaukee, Stokes fully automatic plastics molding presses produce a wide variety of parts . . . with major savings in labor, time, materials and molds. The Stokes automatic molding presses at the Allen-Bradley plant are used for high production runs . . . identical parts, low in material loss, accurate in dimension. Fully automatic molding is reliable, foolproof, flexible and economical.



Allen-Bradley Co., Milwaukee

Allen-Bradley is but one of many plants which enjoy substantial production economies on plastics parts produced by Stokes completely automatic molding machines. Superbly finished parts in all shapes and sizes, thin-wall or heavy section, simple or complex, are molded on these automatic presses . . . at high production rates.

You can learn if your parts are also suited for automatic molding . . . the Stokes Advisory Service will tell you . . . will analyze these parts from your samples or blueprints, without cost, and advise you impartially.

You don't have to *try* automatic molding; we can tell you of its many advantages . . . and if it will reduce costs and pay you a profit.

F. J. Stokes Machine Co.,
5934 Tabor Road,
Philadelphia 20, Pa.

FJS

Stokes makes Semi-Automatic and Automatic Molding Presses, Plunger Presses, Closure Presses, Preforming Presses, Industrial Tabletting and Powder Metal Presses, Vacuum and Special Processing Equipment, Water Stills and Special Machinery.

STOKES KNOWS HOW

Greater Fabric Uniformity Means Better Lamination with Mt. Vernon Extra

Greater fabric uniformity helps give you consistently more even penetration of resins—provides better lamination.

That's why Mt. Vernon Extra fabrics are a favored choice with those who specify laminating materials. . .

Mt. Vernon Extra is spun and woven under constant laboratory control to rigid standards of tolerance. Made from top grades of cotton, it achieves the high degree of uniform fabric quality that successful lamination requires.

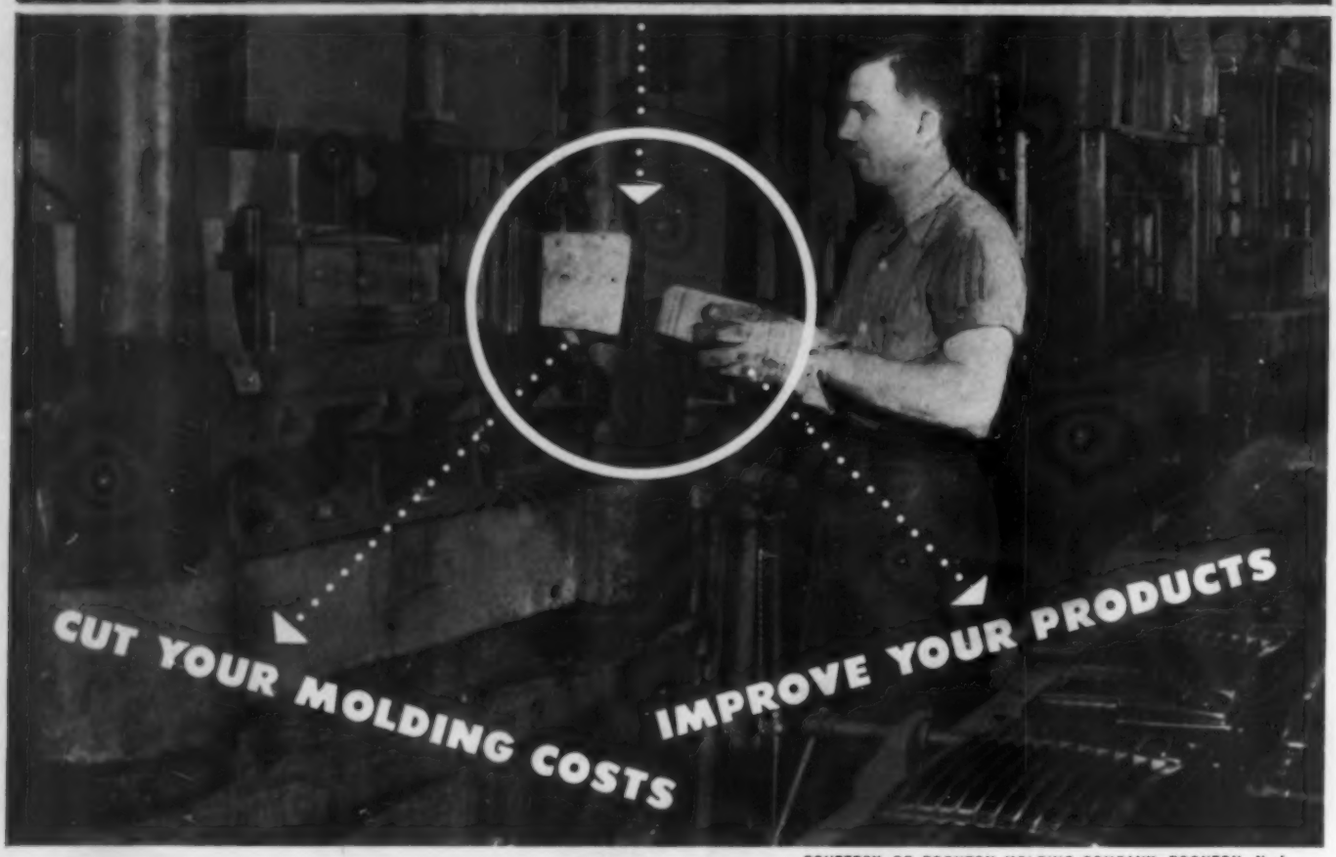
For fabrics of uniform quality, uniform performance in your laminating processes, specify Mt. Vernon Extra.

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. • NEW YORK

Mt. Vernon-Woodberry Mills

Branch Offices: CHICAGO • ATLANTA • BALTIMORE • BOSTON • LOS ANGELES • AKRON

LUBRICANTS and SERVICE that



COURTESY OF BOONTON MOLDING COMPANY, BOONTON, N. J.

Metasap Zinc, Calcium and Barium Stearates speed molding operations, prevent waste. Under heat and pressure, they flow to the surface of the compound and assure

- ***. . . no sticking during rolling***
- ***. . . elimination of shutdowns for scraping mills***
- ***. . . easy flow of the plastics mix***
- ***. . . quick release from the mold***

(Or, if you wish, you can use these stearates for dusting your molds.)

RESULT: Greater volume, fewer rejects . . . costs cut, profit up. And better products to boot! . . . for these Metasap lubricants

- ***. . . do not stain molds***
- ***. . . eliminate blooming***
- ***. . . promote a superior finish***

And Metasap Stearates are backed by Metasap Technical Service. Our "saturation" coverage of the entire country with an exceptionally well-informed, alert force of representatives assures fast, competent service to each and every customer. *You get what you want when you want it.* And technical problems are referred back immediately to our central laboratory, which gladly provides information resulting from accurate tests, makes recommendations based upon your specific requirements.

For complete information, write

METASAP CHEMICAL COMPANY, Harrison, N. J.

CHICAGO • BOSTON • RICHMOND, CALIF.

CEDARTOWN, GA.

METASAP CHEMICAL COMPANY REG. U.S. PAT. OFF.

Stearates

of Calcium • Aluminum • Lead • Magnesium • Zinc

THE MPM 1½" EXTRUDER

The best extrusion machine value your money can buy

Without question, the MPM 1½" machine is unexcelled among extruders for construction, adjustability, variety of materials handled, temperature controls and all-around serviceability and versatility. It delivers greater profit-producing performance than any other extrusion machine of its size on the market.

MADE-FOR-WORK CONSTRUCTION

To protect your product from contamination and discoloration, all parts of the MPM 1½" machine which contact plastic materials are made of corrosion resistant materials through and through. No platings or thin welded layers of hard metals over soft are used on these vital parts. Hence, chipping or cracking of such surfaces due to different expansion rates of base and surface are never encountered.

MPM screws are hardened *all over*, not just on the lands or flights. An operator can clean the screw, hopper, cylinder, liner, etc. of your MPM extruder with a wire brush without any danger of ruining them.

VERSATILITY

You can make every form of extrusion on the MPM 1½" machine—large diameter thin wall tubing, small tubing, rods, belts, strips, channels, wide sheeting, monofilaments for weaving into fabrics. A wide range of dies and die heads for covering wire and for other operations is available, either for delivery with your extruder or on later order.

TEMPERATURE CONTROL

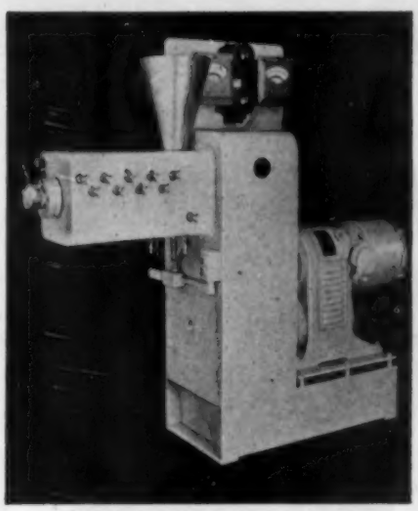
MPM cylinders are electrically heated to reach the highest temperatures necessary. In addition, they may be heated or cooled with steam, air or water. The screw, also, is bored for heating or cooling. Frictional heat can be removed from the cylinder by using any of the nine radial cooling zones provided.

Two automatic pyrometers are included for temperature control with two voltage regulators built in for die heating. Standard stainless steel holder and heater are also included.

VARIETY OF MATERIALS

Production of up to 50 pounds per hour has been achieved with the MPM 1½" machine when extruding polyvinyl chloride. Nylon, Formvar, polyethylene, polystyrene, cellulose acetate, ethyl cellulose, methyl-methacrylate, etc., are also extruded with this unit. The precise adjustability of temperatures in the cylinder and in the die head suit MPM extruders to all of the thermoplastics (except Saran, which requires a special machine.) What's more, a variable speed drive is used to cover a range of screw speeds up to 105 rpm.

As a matter of fact, the temperature and screw speed range available in the MPM 1½" has made it the favorite machine for experimental extrusion work in the laboratories of eighteen material suppliers.



Over a hundred MPM extruder installations are currently in use in the United States and in fifteen foreign countries. Domestic delivery on an order for ten machines has been made within eight weeks.

COMPLETENESS

Your MPM 1½" extruder comes to you *ready for operation*. All that need be done is to connect the electric current and a single water line. A die for extruding rods is supplied as standard equipment.

We sincerely believe the MPM 1½" extruder to be the finest machine of its size that you can purchase. The price is extremely moderate. Please write for more complete information today.

In addition to the MPM 1½" extruder, 1¼", 2", 2½", 3½", and 4½" MPM extruders are available with conveyers, drying cabinets, granulating machines, special sheet windups, monofilament spooling equipment, wire covering equipment, etc. Many shipments include all the equipment needed for a complete extrusion plant, including dies.

modern plastic machinery corp.

mfm

15 Union St., Lodi, N. J., U. S. A.
Cable Address: MODPLASEX

PROBLEM?

Are you losing customers' good will because of breakage of unreliable plastic parts in your product? Do your specs call for a plastic that offers the rare combination of properties such as extraordinary strength, light weight, excellent dielectric properties and a wide range of integral colors with permanent lustrous finish?

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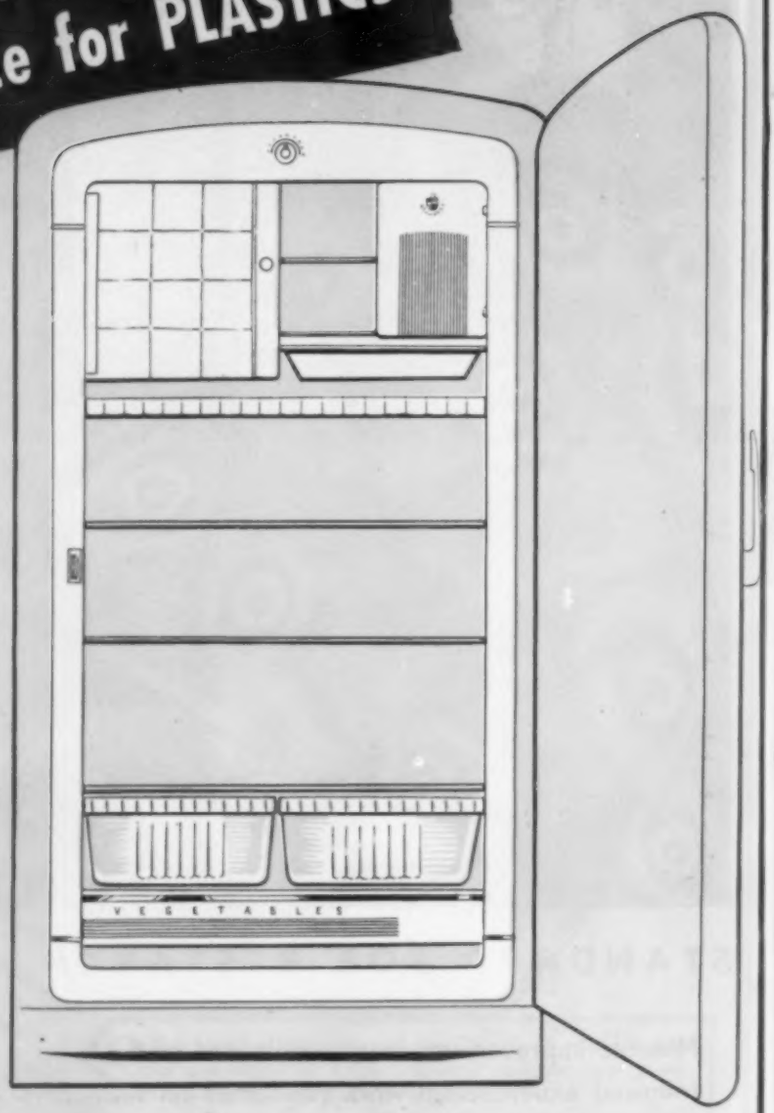

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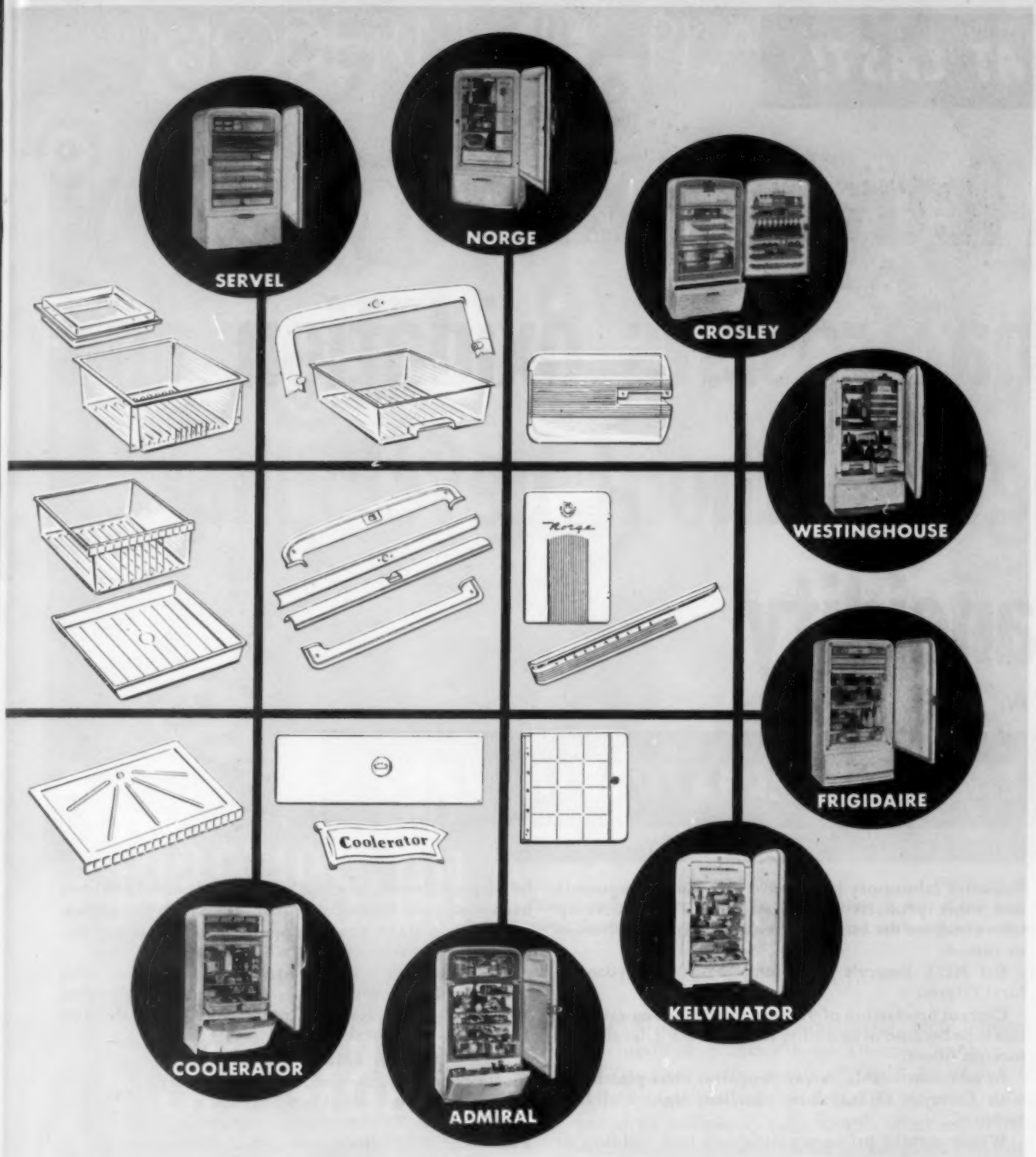

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MODERN PLASTICS

VOLUME 26 AUGUST, 1949 NUMBER 12

COURTESY VARLAR, INC.

Ease of cleaning is an outstanding characteristic of most plastic wall coverings. Crayon scrawls on Varlar can be removed easily with soap and water

Plastics on the Wall

A multi-million dollar market for wall coverings is being invaded by almost every plastic material and fabricating method. Why plastics are making rapid strides is shown by this survey of available wall coverings

SPURRED by new materials and fabrication methods, plastics have attained an important position in the wall covering field. However, a reliable appraisal of their relative standing, as compared to wallpaper, paints, and other conventional wall finishes, is complicated by the great diversity of materials represented and the fact that in many cases they are combined with wood, paper, cloth, or other products in the ultimate application.

Nowhere is there better evidence of plastics' versatility than in the wall covering field. Here is found every important segment of the entire plastics family represented in one way or another: combinations of cellulosics, vinyls, and urea-alkyds with paper; woven saran monofilaments; high pressure and polyester laminates; supported and unsupported vinyl sheeting; injection molded polystyrene tiles; baked urea finishes on tempered hardboard; combinations of vinyls with such materials as asbestos

COURTESY VARLAR, INC.

Varlar waterproof wall covering provides the heavy duty service required by walls in bathrooms and shower stalls

fibers and mineral coloring agents. The list is indeed a difficult one to exhaust.

In the present article, no attempt has been made to include every possible application of plastic materials in the wall covering field nor all of the companies engaged in production. All types of paints, varnishes, and other finishes have been omitted as beyond the scope of this article. From the remaining categories of wall coverings, which may be loosely listed as wall "papers" and tiles, a number of representative coverings have been selected at random. These by no means constitute a complete catalog of plastics wall coverings. The descriptions given, however, will serve to show the properties which make a number of plastics of interest to this gigantic market.

Remodeling opens vast market

The extent of the wall covering market is suggested by sales volume figures on wall papers, as issued by the Wall Paper Institute, which includes most of the industry's major manufacturers. For the year ended June 30, 1948, Institute members, plus five large non-member companies, recorded total sales of 177 million rolls of wall paper valued at $26,000,000.

During the war years, home decorating sagged to a low level from which it has not yet fully recovered. Redecoration of older dwellings as well as the original decoration of new buildings spells a vast market opportunity for those companies whose plastic products fit into the wall covering field. And it is important to remember that even in periods of building expansion such as the past two years, eight older homes are being remodeled for every new one built. In five of those eight, according to market figures, the work of remodeling is performed by the "Saturday afternoon mechanics" who own them.

Plastics are making rapid strides as wall coverings because they so ably meet modern decorating requirements. Their virtue lies not alone in their almost limitless color range, but also in their service qualities—freedom from staining, ease of cleaning, elimination of frequent painting, etc.

In general, plastic wall coverings have thus far enjoyed wider usage in commercial and industrial structures than in private homes. Designers and architects emphasizing "modern" styling have found many of these materials ideal in offices, retail stores, hotels, hospitals, waiting rooms, and other public buildings. Numerous other installations have appeared in restaurants, cafeterias, cocktail lounges, railway club cars, steamships, etc. As patrons become more familiar with these installations, their use will become more commonplace in the home.

Oilcloth-like wall covering known as Marvalon consists of reinforced cellulose fiber which is coated with vinyl

COURTESY BAKELITE CORP.

Most types of plastic wall coverings can be installed without difficulty by regular building mechanics—carpenters, linoleum men, paper hangers, tile setters, etc. Tools necessary and the degree of skill required depend on the particular type of material, type of wall surface, and other factors. It is perfectly possible for the home handy man to install some of the new plastic-paper wall coverings or even to tackle an installation of polystyrene tile.

With these basic factors in mind, it is possible to review impartially some of the plastic or part-plastic materials which appear to be enjoying the greatest degree of acceptance at the present time.

Plastic plus fiber

Marvalon, a product of Munising Paper Co., Chicago, Ill., consists of reinforced cellulose fiber coated with Geon or Vinylite resins. Introduced shortly after the war, Marvalon combines the general appearance and "feel" of oilcloth with superior properties of its own. It has won an important place on the yards goods counters of department stores and variety stores, where it is purchased for use in such items as table covers, place mats, shelf edging, garment bags, lamp shades, and other useful products for the home.

Investigating additional practical uses for Marvalon, the manufacturer soon discovered that it made an excellent wall covering. It is sufficiently tough for this purpose and will not crack, peel, or fray, thanks to the combination of the reinforced cellulose fibers and vinyl resin coating. Extremes in temperature do not affect Marvalon adversely; it is reported that it will withstand heat up to 250° F. Protected by the clear plastic surface, the printed patterns and solid colors will not wash off or fade. The coating also makes the product stain resistant, odorless, and easily cleaned.

Marvalon comes in solid colors, floral designs, pastels, checks, and various other patterns. It is put up in rolls—24-yd. rolls for the 54 in. width, 10- and 24-yd. rolls for the 12 in. width, 24-yd. rolls for the 42 and 46 in. widths. Decorative possibilities with the material are legion, due to the great variety of colors and patterns available. Also of interest to the prospective user planning to redecorate the kitchen or other parts of the house is the fact that Marvalon is economical—lower in cost per yard than oilcloth.

As a wall covering, Marvalon may be applied by using conventional wall paper (wheat) paste and hanging techniques. For those unskilled in the art of paper hanging, the strength and pliability of the material make it easier to handle than regular wall paper. Unpainted walls should be sized before application, while on painted surfaces the material may be applied directly over the old paint. Previous paper should be removed to prevent the Marvalon application from loosening the old paper; due to the plastic surface, a longer period is required for drying of the paste than in the case of ordinary wall paper.

Double pasting of Marvalon with a 5-min. time interval between the two applications is recommended by the manufacturer to insure that the material will be thoroughly expanded before being placed on the wall and will slide into position easily. In humid weather, a tablespoon of Lysol stirred into the paste helps prevent formation of mildew during the somewhat prolonged drying period. Since Mar-

PHOTOS COURTESY THE ULLMAN CO.

Tru-Grain wallpeper looks like real wood paneling. Grease stains, ink, and dirt can be washed off cellulose surface

Wall which looks like bamboo is actually Tru-Grain wallpaper printed in plastic ink and covered with cellulose

valon does not adhere well when overlapped face to back, all joints should be butt joints.

Resins integrated with paper

Varlar stainproof wall covering, produced by Varlar, Inc., a division of United Wallpaper, Inc., Chicago, Ill., created a market sensation at the time of its market introduction about two years ago. With the recent addition of 24 new styles, including nine new plain tints taking their color cue from the muted shades of bird plumage, the total number of Varlar patterns available reached 117. Some of these patterns contain as many as 13 separate colors.

Varlar is neither a coated wall paper nor a lamination, but a complete product in itself, built from the "ground up" through the use of thermoplastic resins integrated with paper in such a way that flexibility and ease of hanging are maintained. These highly resistant resins, according to the manufacturer, are "cured by a special heat treating process which results in a prefabricated stainproof wall covering."

Fluctuations from excessive heat and humidity to extreme cold are said to have no effect on Varlar, because of the fusing of the ingredients. The resins employed in its production are inherently resistant to stain, mildew, and mold and the product is not attacked by vermin such as roaches, silverfish, etc. It is applied to wall surfaces with a special type of Varlar adhesive or, for locations in which excessive moisture is present, Varlar liquid cement. Varlar can be hung by the regular paperhanging trade without special tools, training, or equipment.

Washability, fire resistance, water resistance, abrasion resistance, color fastness, tear resistance, salt water resistance, and other properties of Varlar have been exhaustively studied by the manufacturer's own laboratories and rigid specifications established. Soap and water alone suffice to remove from Varlar such greases and oils as Crisco (hot or cold), chicken fat, butter, lubricating grease, Unguentine, furniture polish, etc. Ink, wax crayon, lipstick, shoe polish, and other materials may also be removed without damage to the wall covering; in some instances, a light sponging with turpentine is recommended for complete removal. The Varlar technical department has also tested a number of cleaners and disinfectants likely to come in contact with the material and found them non-injurious to Varlar.

Varlar is 24 in. wide and is packaged in rolls 50 ft. long, each containing 100 square feet. It is priced at from 10 to 17½¢ per sq. ft., depending on the pattern.

Paper-backed plastic

Sandura Co., Inc., Philadelphia, Pa., offers as its entry in the plastic wall covering field an interesting product known as Sandura-Wall, a tough transparent plastic sheet supported by a strong paper back which makes for ease of handling and installation. The product is so durable that the company sells it under a 10-year guarantee, offering to replace free of charge any material on which the colors or designs wash off during the guarantee period.

The tough plastic surface of Sandura-Wall is a special formulation of urea-alkyd resins. According to the manufacturer, it is formulated so that it will not yellow, will offer positive resistance to alkalis and solvents, and so that no amount of washing or cleaning will affect the color or the surface. The plastic top sheet, completely transparent and colorless, is laid onto the specially treated paper back by

PHOTOS COURTESY U. S. PLYWOOD CORP.

Doors and lower part of walls in automobile showroom are covered with tufted red Kalistron. The vinyl sheeting resists scuffing and eliminates frequent and expensive repainting which was necessary when showroom walls were plastered

Hospital corridor has walls covered with Kalistron which is colorful, scuff-proof, and easy to keep clean. The transparent vinyl surface protects the color which is fused to under side

a coating process, so that the color and design are completely protected.

Due to the tensile strength of this product, it will bridge and conceal minor plaster cracks. Permanent newness of the material is assured by the fact that grease and dirt can usually be removed with a damp cloth, while stubborn stains are easily cleaned with soap and water or other household cleaners without damaging the plastic surface.

The manufacturer points out that home owners and builders have been demanding permanent cleanability in a wall covering and have heretofore been able to meet the requirements only with heavy-backed, expensive wall coverings. Sandura-Wall, a light product with a guaranteed surface, is intended to give consumers the advantage of a permanent wall covering at low cost.

This product is available in 25 different patterns, including seven glossy tiles, eight glossy pastels, and ten new suede finishes in attractive decorator colors. The soft suede effects were recently developed for bedrooms, living rooms, nurseries, and for wainscoting heights. Sandura-Wall is packaged in triple rolls containing 108 square feet. Tile designs run 48 in. wide and 27 ft. long, while the glossy pastels and suede patterns are 27 in. wide and 48 ft. long. Suggested retail price for the product is $3.95 per single roll, or approximately 11¢ per square foot.

Independent laboratory tests on Sandura-Wall covered light resistance, washability, waterproofness, abrasion resistance, staining, solvent resistance, and steam resistance. Samples of the tile colors, exposed outdoors for approximately nine months, showed no fading and only a slight degree of darkening or graying. Other samples withstood 200 hr. of simulated sunlight in a Fadeometer without loss of color, a significant test since the federal standard for sunfast wall paper is only 24 hours.

In a wet abrasion test, using a ⅛ of 1% soap powder solution and a pair of scrub brushes with a 5-lb. load, Sandura-Wall withstood 3000 brush strokes with practically no signs of damage. Continuing the test for another 740 strokes with an abrasive cleaner added merely resulted in slight loss of gloss.

Stain tests with such materials as iodine, lipstick, Mercurochrome, fountain pen ink, dirty grease, brown shoe polish, and chocolate indicated that most could be removed satisfactorily with soapy water except for iodine and shoe polish after a period of 1 hr. and lipstick and Mercurochrome after 24 hours. Prompt removal of all stains is recommended, since chemical action may set them in time.

Samples of Sandura-Wall were immersed in denatured alcohol, carbon tetrachloride, turpentine, and varnolene (similar to many household dry cleaning fluids). Softening while wet was nonexistent or negligible, and no permanent damage resulted in any case. Subjecting samples to a steam jet for six hours temporarily softened the finish, but no change in appearance or appreciable permanent damage resulted.

COURTESY SANDURA CO., INC.

Surface of Sandura-Wall is a special formulation of urea-alkyd resins which resists alkalis, solvents, and grease

COURTESY CHICOPEE MFG. CORP.

Striped fabric on upper part of wall in theater lounge is Lumite woven saran. It is non-flammable, easy to clean

Sandura-Wall is applied to wall surfaces in essentially the same manner as wall paper, with minor exceptions as noted below. Application is easily handled by professional paperhangers; it is said that many amateurs found little difficulty in doing the work themselves. The four departures from customary wallpapering practice are as follows: 1) the material is soaked in warm water for 30 min. prior to application; 2) paste of thicker consistency is required; 3) a small quantity of Lysol is

(*Please turn to page* 160)

COURTESY I. B. KLEINERT RUBBER CO.

Sewing operations on vinyl films reach huge proportions in many fabricating plants

Problems of the VINYL

FABRICATION of vinyl film (10 mils and under in thickness), used primarily as a fabric, has moved along rapidly during the last two years in volume, diversification, and techniques. This new industry is already exceedingly complex but certain broad features are common to the operations of nearly all fabricators. These can be pointed out as illustrations of how the industry is meeting its problems in an effort to give the customer a product that will satisfy—a quite different product than anything ever before offered and consequently full of mystery for the housewife, chief buyer of the finished article.

It was only natural that fabricators of vinyl film should spring largely from those firms who had experience in the needle trades; the finished products must generally be fashioned and shaped by sewing or heat sealing after having been cut to the desired pattern. Bonding by heat or solvent sealing involves new techniques for the needle trades industry and has taken time to perfect, but the time is not far distant when heat sealing will be more common than sewing in vinyl fabricating plants. Today, however, there is a great preponderance of sewing machine stitching, with craft improvising and adopting all sorts of gadgets and alterations to meet the new conditions and problems encountered when switching over from textiles to plastic.

Most of the difficulties in sewing derive from a tendency of vinyl film to tear more easily than cloth after it is punctured by the needle, and from its smooth, slick surface which, with other properties inherent in the film, may produce friction that results in sticking or generation of static electricity when moved rapidly under tension over another smooth surface.

Humidity affects operation

In the experience of the Singer Sewing Machine Co., New York, N. Y., which has worked with its customers in devising means to overcome these problems, can be found examples of what can be done. Several years ago, when the film was originally introduced, an attempt was made to stitch binding on women's make-up capes. After thinking it had the problem solved in its plant at Elizabethtown, N. J.,

Singer found that the same technique wouldn't work in the customer's factory in Cleveland. The material reacted differently due to increased humidity conditions which caused the material to stick and pucker.

From these first experiences, the company learned many lessons that have been passed on to the trade in the form of advice or improved attachments for sewing machines. One of the latest involves stainless steel for attachments which serve in place of, or over, the throat plate of the machine. This part is a smooth metal piece that forms a narrow strip across the base of the machine and along which the operator pushes the cloth under the needle. The Singer company spent nearly five years working with the steel industry in the development of stainless steel which can be soft soldered. Soft soldering is necessary because some sewing machine attachments require many parts. The transverse binder, for example, is a composite of seven different sections soldered into one piece. It was found that for best results the working surface of the stainless steel part should be embossed in order to minimize drag or friction on the film; thus the danger of extreme tension which causes puckering is avoided and static electricity is minimized.

Most of the company's special attachments for sewing machines are now made with this specially prepared metal, known in the industry as Rigidized Metal and manufactured by Rigid-Tex Corp., Buffalo, N. Y.

No. 2 of a series on vinyl film, sheet and coatings

Another reason for the use of special metal for certain sewing machine parts is that vinyl film is sometimes more abrasive than cloth. Stainless steel assures long life of the attachments or fittings.

3000 different sewing machines

There are scores of these attachments for the various types of ruffling, seaming, binding, and folding operations necessary in a needlecraft plant. Any up-to-date plant manager is aware of their capabilities when sewing cloth; innovations such as the "rigidized" metal described are generally necessary, however, when there is a switch-over from cloth to plastic. In addition, every needlecraft foreman in the country has a bag of tricks of his own that he uses to overcome problems or speed up production in his own plant. Something of the diversity of operations involved in sewing may be realized when it is

FILM *Fabricators*

As a new industry grows up around vinyl film, new equipment and techniques have to be developed and proved

COURTESY SINGER SEWING MACHINE CO.

Many gadgets and special attachments are provided for sewing such items as the garment bags at right

COURTESY I. B. KLEINERT RUBBER CO.

Dress shields with vinyl liners are turned out by thousands per day. Heat sealed liners are covered with cotton cloth

COURTESY GOODYEAR TIRE & RUBBER CO.

Table coverings printed in a variety of patterns are cut to the proper length before they move to hemming machines

pointed out that Singer alone produces over 3000 varieties of sewing machines with many types of feed and special fittings.

The treatment and handling of sewing thread is an operation that varies in almost every needlecraft plant in the country. Modern machines will operate at from 4000 to 5000 stitches per minute. That speed requires careful thread handling to avoid breakage, knotting, back-lashing, and other problems. Mercerized cotton thread, frequently treated with oil, has been used in the textile industry for years to help overcome these problems. The oil, generally a light lubricating type, or sometimes an ounce of cutting oil to a quart of water, is applied by running the thread through an oil-saturated cotton pad strapped to the sewing machine, or from an oil cup which lubricates the thread before it enters the needle eye, where the oil lubricates the needle as well as the thread.

Similar methods of applying oil are used when sewing vinyl with mercerized thread, as are various other tricks that help to minimize friction. Sometimes a slight amount of cyclohexanone or some other solvent is applied to the vinyl in minute quantity just before the film reaches the needle. The idea is to soften the material; but critics claim the finished product will tend to discolor in the solvent-dabbed spots after a few months' use. A criticism of mercerized thread for sewing vinyl is that it will tend to act as a wick through which the plasticizer in the film will escape. Then the film along the seam will become brittle and thus be more likely to tear after it has been in use a short time. Experiments are under way for coating the thread with resin which will supposedly seal the seams tight and also prevent plasticizer wicking.

Use of nylon thread is most generally recommended as the best solution to thread problems, but not all fabricators agree. One of the most successful states that he used nylon for two years but experimented with cotton thread treatment during that time and perfected it to such an extent that he now uses cotton exclusively.

Singer Sewing Machine Co. experts state that best results can be obtained by using nylon thread and no oil or talcum. In fact, oil should never be used with nylon thread under any circumstances. In place of size 0 or 00 mercerized cotton, size K13 or K15 nylon thread is recommended. These are one-quarter the diameter of the cotton threads, thus permitting use of a smaller needle and needle hole in the throat plate. Nylon thread is more elastic than cotton and gives a stronger seam. It costs about the same as cotton because thread is bought by the pound, and there are more yards per pound of nylon. However, due to its elasticity, it will continue to unwind from the spool after the machine is stopped, resulting in a back lash. At high speeds, the needle gets so hot that it may fuse the nylon, and the thread's extreme elasticity tends to promote puckering; but proper adjustments, together with the use of an air blast needle cooler with which Singer machines can be equipped, will eliminate these harassments.

Stitches per inch

The fewer stitches per inch, the less likelihood there is that the vinyl film will tear. Experience indicates that the shortest practical stitch for sewing vinyl film is seven to the inch. Cloth is generally sewn with 16 to 22 stitches per inch. Straight seams on vinyl film can be stitched at from 50 to 60 ft. a minute.

Where stress is not important, more than seven stitches can be used per inch, generally for orna mentation. Button holes on a raincoat, for example, which are reinforced with one or more extra layers of vinyl film, sometimes are sewed with 10 to 12 stitches per inch. Most button hole machines are

equipped with special cams to regulate the number and formation of stitches.

There is no particular problem with needles except that round pointed ones are recommended. Experience with spear and diamond pointed needles has been unfortunate—they tend to cut and weaken vinyl film. Multiple needle machines can be used just as successfully with vinyl as with cloth. For example, two needles are used for two rows of stitching in attaching a ruffle to a curtain. The top strip on a shower curtain is frequently sewed with four needles. The four rows of stitching give both strength and style.

Among the more serious problems not yet completely worked out among vinyl film fabricators is the question of the proper weight material to use for different applications and the variations in weight sometimes supplied by various film producers. Some producers complain that there has been a cheapening of the industry in certain quarters by a few fabricators who use 3.0 or 3.8-mil film when 4 mil should be used.

The fabricator buys his film by the pound, but it is sold over the counter as yard goods or in cushions, curtains, and the like. The fabricator using the thinner material thus gets more finished units per pound, but the quality suffers, and the entire industry gets a black mark for the irresponsibility of a few processors. There is some talk in the industry of changing the pricing method for film from pounds to yards in order to help overcome this complaint.

Although 4-mil film is generally standard for most applications, there is a tendency to increase the thickness for many items. Raincoats in 6-mil film have now become common on the market; according to one fabricator, almost any film intended for outdoor use should be 6 or 8 mils thick. This same fabricator thinks slip covers should be from 4 to 6 mils thick, and that 6 or 8 mil should be used for chair pads. He says that sacrificing quality for price will eventually spell ruin for any fabricator when buyers become more accustomed to evaluating vinyl film. His own experience includes a $15,000 loss on a 2-mil chair pad when 90% of the pads came back because of splitting at the seams.

Price is a basic problem

Apparently this film thickness controversy is basically a pricing problem. Buyers sometimes demand that a certain item be produced at a set price, say 59¢, when the article in question cannot possibly be produced at that price in standard 4-mil film. In such cases, degrading of film is the end result. Unfortunately, there are some fabricators in the business whose only answer to competition is price reduction, and until the industry becomes more stabilized and these fabricators learn how to compete by the use of more expert marketing and merchandising ideas, the price angle is going to remain a bothersome feature of the film products industry.

Although film weight is a most important element in this price situation, it would be unfair to leave the impression that thinner than 4-mil film is unemployable in the vinyl fabricating industry. Most experts have come to the conclusion that the minimum thickness to assure satisfaction in a calendered film is generally 4 mils, but there are many applications where 2-mil cast film can be satisfactorily used, and its particular properties, such as transparency and uniform thickness, make it useful in the manufacture of items like certain types of drapes and tablecloth covers.

An interesting development along this line is the recent announcement of the Goodyear Tire and Rubber Co., Akron, Ohio, that in addition to its 4-mil calendered film, the company will start using part of its casting equipment for production of 2-mil vinyl film that can be used in certain places where calendered film is generally employed. This is obviously the Goodyear company's answer to competi-

(*Please turn to page* 157)

A number of quilted play pen pads with vinyl covering are cut simultaneously with automatic machines before stitching

COURTESY I. B. KLEINERT RUBBER CO.

ENGINEERED BICYCLE HORN

Bicycle horn has six internal parts molded of transparent polystyrene. The other megaphone-like piece is acetate

SEVEN carefully engineered plastic parts are used in the complicated assembly of an inexpensive new bicycle horn manufactured by Sound Devices Inc., Covington, Ky. The horn, called the Ton-Air, produces sound by means of a vibrant disk and two sets of valves and springs which rapidly interrupt a jet of compressed air to produce two different musical notes.

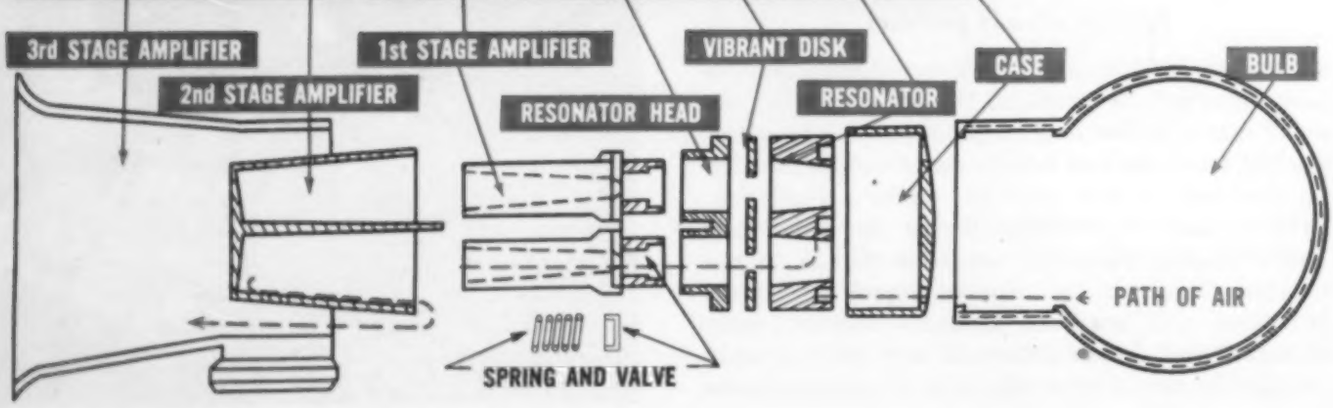
The horn consists of six transparent polystyrene parts, a megaphone-like cellulose acetate third stage amplifier, a rubber bulb, and a rubber vibrant disk. The springs and valves in the first stage amplifier pipes are metal.

When air is compressed by the rubber bulb, it enters labyrinthine channels in the resonator. These channels could be straight for acoustical purposes, but are curved for compactness. It is possible to vary the pitch of the horn during assembly by turning the resonator, thus cutting down the effective size of the channel through which the air must travel. Final tuning for resonance is accomplished at the factory by rotating the first stage amplifier pipes in their cam sockets, thus varying the tension on the spring inside each pipe.

The Ton-Air Horn is molded and assembled by Kusan, Inc., Nashville, Tenn. The small amplifier pipes are molded in a six-cavity die, and the other four polystyrene parts are molded in an eight-cavity combination mold. Separate molds were made because the original design called for only the pipes to be molded of a transparent material. It was later decided to mold all internal parts from transparent polystyrene to cut material costs.

The cellulose acetate third stage amplifier is molded in a two-cavity die with side pulls on two sides to mold the undercut around which the metal clamp fits. There are 14 assembly operations involved in the production of the horn, including seven cementing procedures.

Drawing below shows how various parts fit into horn assembly and traces path of air through the horn. Two sets of parts (omitting the rubber bulb) are shown in picture at left. Top set shows relative positions of parts in horn. Pieces in lower set are turned so that their shape is clearly seen



Plastics Win in a Breeze

Two new air circulators, high-styled with butyrate and phenolic, invade the electric fan market

New air circulator with two-part pastel green butyrate case is only 9 in. wide, 10 in. high and 3½ in. thick. It weighs 2¾ lb., can be carried easily

Complete fan and two sets of case halves. Self-tapping screws are inserted in cored bosses to assemble the two-part case

Handle and grilles are molded into case. Thus there are no loose parts to cause noisy vibrations

Cartons in which circulators are shipped can be used as stands to display fans in show windows or at point of sale

FOR some 10 years, more and more emphasis has been placed on plastics by Cory Corp., Chicago, Ill., and by Fresh'nd-Aire Co., a division of Cory. Plastics are now applied by Cory to almost every item in its rapidly expanding line of products. As a company whose growing use of plastics covers both compression and injection molded materials, Cory selects its materials carefully for maximum performance and places major emphasis upon product styling as an important sales and merchandising consideration.

The latest Cory items in which plastics play a major part are two new type fans produced by Fresh'nd-Aire Co. as an active bid for a bigger chunk of the consumer fan market. These include the Fanette, a compact, portable fan of unique design weighing only 2¾ lb., and the Models 90 and 120 Fresh'nd-Aire Circulators, which are heavy-duty 9-in., two-speed, and 12-in., three-speed electric air circulators designed for home and office use. In developing both these products, the Cory organization worked directly with industrial designers to obtain the utmost in styling and functional features.

Departure from tradition

The Fanette, designed by Charles E. Jones & Associates, Inc., Chicago, capitalizes on the light weight, inherent color, and sturdiness of molded

Larger air circulator has mahogany phenolic base. Front grille and the motor enclosure are molded of tan butyrate

Fan is supported in bearing at each side of the molded phenolic base so that it can be tipped to any desired angle

thermoplastics for a complete departure from the traditional construction and appearance of small fans. Only 9 in. wide, 10 in. high, and 3½ in. thick, the Fanette has an integrally molded handle which makes it easy to pick up and move without fear of injured fingers. The foldable metal base forms a non-tipping foundation and is secured to the plastic case at each side so that the unit can be quickly adjusted to any desired position—even pointed straight up if the user so elects.

The two halves of the Fanette housing are injection molded in pastel green Tenite II cellulose acetate butyrate by the Plastics Div., General American Transportation Corp., Chicago. Integrally molded louvers in each side of the case provide a directed air flow and guard the three-bladed metal propeller. The one-piece louver construction eliminates parts which often loosen and rattle in fans of conventional construction. Five cored bosses around the edges of the case parts speed the assembly of the unit with self-tapping screws.

The Fanette name plate, set off by horizontal lines, is molded directly into the center of the front louver. Model identification, electrical rating, and additional information are similarly molded into the center of the back louver piece. The solid center portion of the rear louver also helps support the weight of the fan and motor assembly.

Two grooves molded in each side of the case just below the pedestal attachment are matched by jogs in the metal legs, providing channels through which the cord may be wound when the fan is not in use. Folding the metal legs together locks the cord securely in carrying position.

Not a "plastic replica"

With its compactness, light weight, ease of cleaning, and modern styling, the Fanette is not a "plastic replica" of the conventional electric fan, but a new product with an expanded potential market. Equally at home on table, desk, or floor, it may be easily packed into a suitcase for traveling. According to Fresh'nd-Aire executives, the use of molded plastics in this product has enabled them to produce a low-cost, extremely small fan which still will out-perform most full-size conventional type fans now on the market.

The Model 90 and Model 120 Fresh'nd-Aire furniture-styled Circulators combine three molded plastic components—a tan butyrate front grille, a streamlined motor enclosure of the same material, and a massively styled, non-tipping base of mahogany mottle phenolic. The base is so designed that the fan assembly is supported in a bearing at each side of the deeply cut opening in the base, permitting it to be tipped to any desired angle. Joseph Palma, Chicago industrial designer, handled the styling of these two models.

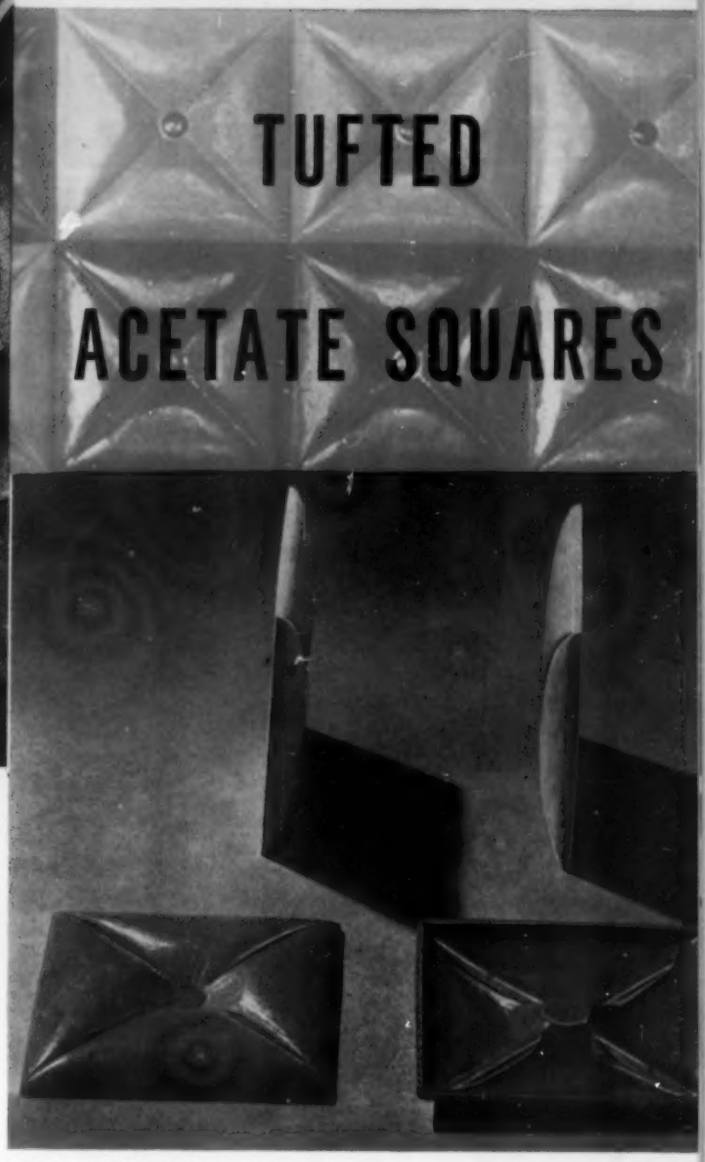
The General American Plastics Div. molds the sturdy butyrate front grille and motor housing cap for these units. The grille is cored at four points around the periphery for attachment to the stamped metal guard which encircles the three-bladed fan.

The bi-pillar type bases for these air circulators are made in two sizes for the 9 and 12-in. models. Both are compression molded by Molded Products Corp., Chicago, using general purpose phenolic mottle material. Wall thickness is ⅛ in. and internal ribs are provided for increased strength. Pillars are horizontally cored in the mold to accommodate the metal pins which support the fan assembly and permit it to be swiveled to the desired position.

Both the Fanette and the two larger models are packed in dual-purpose shipping cartons designed to protect the units during transportation and to serve as floor or window display stands at point of sale. The cartons, printed in color, feature the company's trade names and tie in with national advertising.

TUFTED ACETATE SQUARES

Vertical surfaces of bar are covered with tufted acetate squares in two different colors arranged to form pattern



Each molded acetate tile is 4 in. square. The "folds" of the tuft act as ribs which give the tile greater rigidity

PHOTOS COURTESY CELANESE CORP. OF AMERICA

A GOOD tufter on furniture or wall decoration, applying leather or other flexible decorative sheet material over cotton padding, gets between $4.00 or $5.00 an hour, it is reported. So the average home owner has simply not been able to afford decorative tufting—and when he has tried to do it himself the results have frequently been unprofessional in appearance.

For this market Deks, Inc., New York, is now producing Deks molded diamond tufted plastic squares. The squares are actually Lumarith XF high heat resistant acetate tiles, 4 in. square, so designed as to present the appearance of tufted leather. The tiles are ½ in. high at the deepest point, are made with the "fold" of the tuft to act as a rib or strut to provide rigidity against flexing, have small flat circular areas in the center through each of which a tiny hole is punched. Anyone can decorate with Deks by merely pushing the prong of a decorative upholstery tack through the hole and hammering the tack into the surface to be decorated. A patent is pending on the product.

Unfinished wooden boxes covered with acetate tufted tiles look luxurious, can be used as jewelry or trinket boxes

Colors available

The tufting tiles come in red, black, chartreuse, gray, forest green, and fuschia shades, and are packed nine to a box to cover one square foot. They are suggested for application on playroom walls, kitchen and dinette baseboards and chair rails, powder rooms, closets, valances, mirror frames, bed headboards, hassocks, show-case bases for stores, and also on boxes for jewels and trinkets.

They are washable, vermin proof, and retain the accuracy of their tufted shape indefinitely.

Radio

COURTESY SANTAY CORP.

COURTESY RCA VICTOR DIV., RADIO CORP. OF AMERICA

Bezel assembly on finished set is edgelighted from within. At eye level the RCA Victor name is visible as in photo at right and lower picture above. As observer stands to tune set, the name vanishes and tuning scale appears

THE outstanding optical properties of the acrylics underly their specification in a host of products involving effective illumination and special lighting effects. For its new Model 8-TR-29 combination radio and television set, the RCA Victor Div., Radio Corp. of America has designed an interesting prismatic bezel assembly molded of Lucite or Plexiglas, which is said to be a unique application of plastic materials in the radio field.

Prism principle used

RCA Victor believes that the intricate piece, measuring 6½ in. long and 1 in. thick in both directions, represents the first time that the escutcheon, prism dial, and novel features of the company's trade name have been combined in this ingenious manner. In use, the edge-lighted dial is so mounted that when the set is viewed from the front, the words "RCA Victor" are visible in gold letters against a rich maroon background. As one stands and approaches the set for tuning, the words disappear almost magically, and the slide-rule type dial scale, carrying both AM and FM calibrations in white against a grey background, comes into view.

This unusual dial treatment is based upon the light-transmitting characteristics of a prism. The principle itself is well known, but its embodiment in a plastic part which could be produced rapidly and reasonably to the required standard of accuracy represents a notable achievement by RCA Victor engineers, and the Santay Corporation, Chicago, Ill., which handled all details of mold design, and carries out the molding, decorating, and assembly operations.

According to Santay executives, the degree of finish on the four-cavity mold for this piece is the closest approach to a true optical surface that they have ever attempted. The necessity of obtaining absolutely smooth surfaces in the casting is obvious, in view of the conspicuous position of the bezel in the cabinet of the set and the critical role it must play in its dual function as an identifying name plate and tuning scale.

Straight lines and hard, sharp edges throughout, a prerequisite in obtaining the desired optical properties, make the RCA Victor prismatic bezel job particularly difficult to mold. The die includes parts for two complete bezels—the major piece, which is

Dial Does Vanishing Act

Prismatic assembly of two acrylic parts displays maker's trade name or tuning scale, according to the angle from which it is viewed

deeply slotted for insertion of the dial scale, and the scale itself, which is 3/32 in. thick and ranges in width from 1 1/16 in. at the center to 1 7/16 in. at each end. Length of the molding cycle is controlled by the larger piece, with sections as high as 1/2 in. thick. The complicated, angular coring of this piece is accomplished by means of cam actions in the mold itself.

The complete shot, weighing 6 oz., is run on a 12-oz. HPM injection machine fitted with an injection pump capable of delivering a pressure of 30,000 p.s.i. This machine over-capacity is reported to insure complete freedom from bubbles in the pieces. Heavy runners are used to maintain maximum pressure on the material in the cavities. The job runs on a 2-min. cycle with mold temperature maintained at 140° as an aid in removing the shot undamaged from the die. Despite the critical nature of the job, rejects are extremely low.

COURTESY HYDRAULIC PRESS MFG. CO.

Complete shot after removal from die. Two prismatic bezel assemblies are molded on each 2 min. cycle of the press

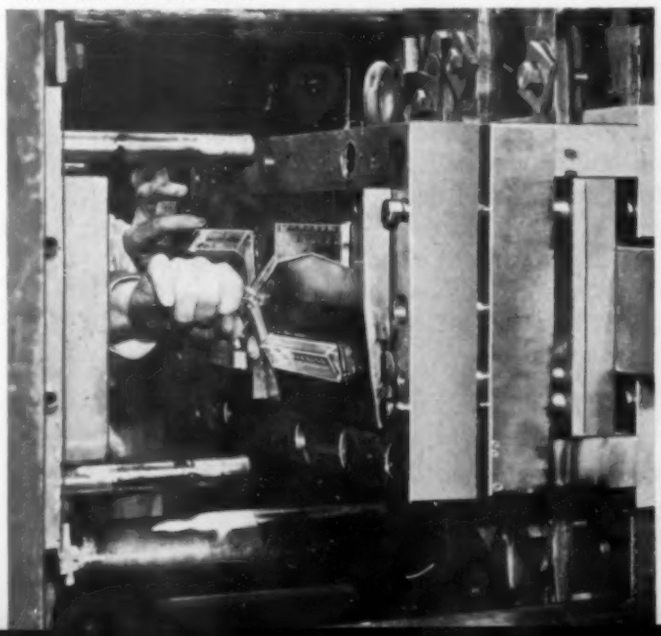
Method of painting directs light

The complicated finishing of the piece requires filling in of the depressed numerals on the dial scale, followed by painting most of the back of this piece in grey, leaving a clear strip through which the dial pointer may be observed. On the larger piece, the words "RCA Victor" and four surfaces are painted gold, then the maroon backing is applied behind the name and a final protective coat of grey paint is added. This method of decorating properly directs the illumination from the dial light into the bezel and gives it the required two-way optical effect.

In the final finishing operation, the dial strip is cemented into the slot of the larger piece, and the bezels are individually packed in heat-sealed cellophane envelopes for shipment to RCA Victor.

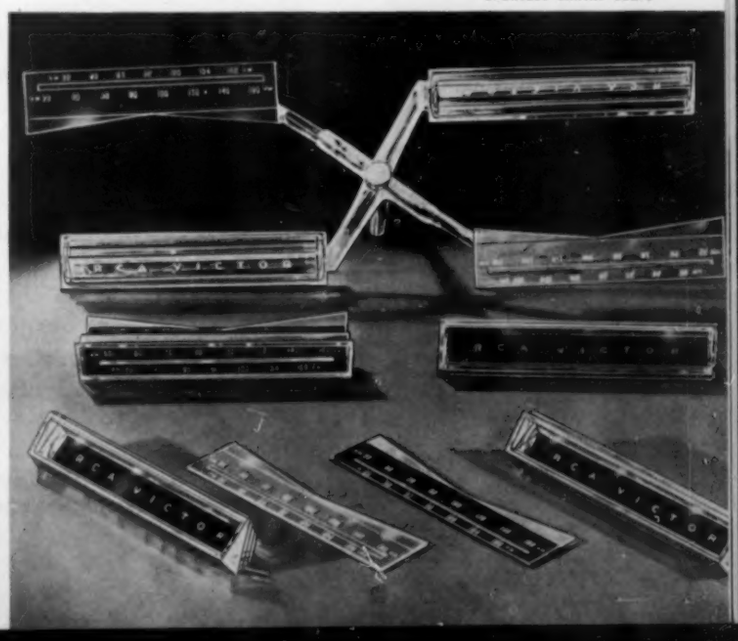
Bezels are run on 12-oz. press equipped with 30,000-lb. injection pump. Molding is complicated by angular design of two bezel parts

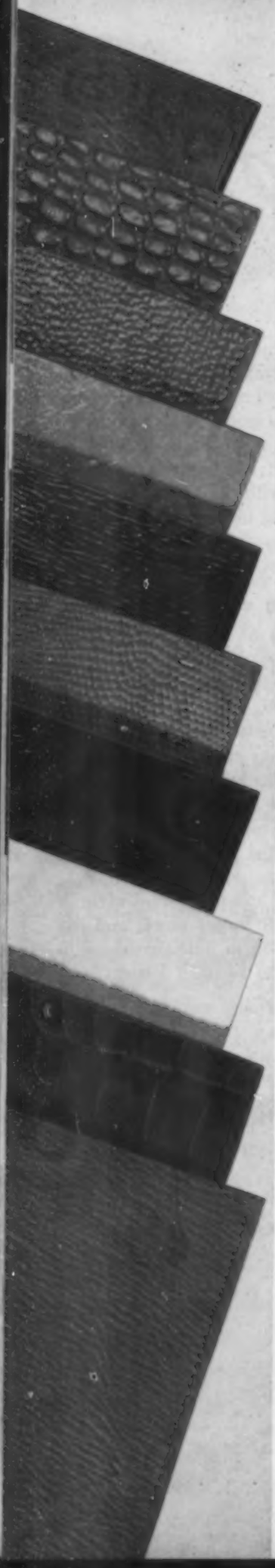
COURTESY HYDRAULIC PRESS MFG. CO.



Heavy runners and over-capacity injection pump prevent bubbles in pieces. Molded-in calibrations for the dial cover AM and FM

COURTESY SANTAY CORP.





Thermoplastic Sheet

A UNIQUE type of thermoplastic sheet material developed by United States Rubber Co., has entered the commercial production stage and is being made available to fabricators. Known as Royalite, the material's interesting range of properties, and the fact that it can be easily handled on standard thermoplastic sheet fabricating equipment, are expected to open numerous applications hitherto untouched by the plastic field.

Originally produced in 1940 under the name Es-Es, and later identified for a brief period as Versalite, Royalite served during the war in many important applications, ranging from radomes to top secret uses which still remain undisclosed. Since the war, U. S. Rubber has perfected the material in texture and color for commercial and domestic uses.

Royalite combines many of the desirable characteristics of both synthetic rubber and plastic. Chemically, it is described as a copolymer of butadiene and acrylonitrile and styrene and acrylonitrile. Its composition includes Buna S and Buna N rubbers, acrylonitrile, styrene, a peroxide catalyst, modifiers, and emulsifying agents. The patent under which Royalite is manufactured covers several different types of resins with widely varying properties in the finished product.

Variety of surface finishes

Royalite, manufactured at U. S. Rubber Co.'s Chicago plant, is currently available in flat sheets in standard colors, sizes, and thicknesses, in several grades of hardness or flexibility. Finish may be smooth, grained, or patterned, affording a variety of decorative effects in the finished product. In addition to the standard type material, Royalite is also available in expanded form where flotation or special insulating properties are desired.

This new, tough thermoplastic can be produced in almost any color from a thin milk white and a group of delicate pastel shades to the deep, dark tones and black so extensively used in modern styling. The pigmented color is an integral part of the material, extending uniformly through the entire sheet. Marbleized effects are also obtainable, as well as special sheets having different colors on the two outer surfaces.

General physical and chemical properties vary somewhat as the pigmentation and surface finish are changed. The deep grains, such as walrus, alligator, and reptile, tend to reduce the impact strength of the material, as well as to lower tensile strength and elongation. In the shallow grains, however, physical properties are substantially the same as for the plain sheet.

Royalite is supplied to fabricators in thicknesses ranging from 1/32 up to 1/2 inch. Standard sheet sizes range to a maximum of 48 by 80 in.; grain finishes run 24 by 48 in.; and reptile comes in 22 by 26 in. sheets. The material is offered in three degrees of hardness—200 series, 300 series, and 400 series, the latter being the most flexible of the three.

Waterproof, stainproof, greaseproof, odorless, mildewproof, verminproof, warm to the touch, scrubbable, tough, and light, Royalite has many properties of interest to manufacturers and product designers. It will not stain, spot, or streak, even in salt water. Moisture absorption can be as low as 0.3% after immersion for 24 hours. Such materials as oil, grease, cold cream, lard, butter, crayon, etc., are easily removed from the material without leaving stains. It is unaffected by lipstick, ink, hair tonic, blood, liquor, catsup, and numerous other products which stain many materials. Stocks formulated for acid resistance resist hydrochloric, nitric, phosphoric, and sulfuric in 50% solution.

All types of finishes — smooth, grained, or patterned — and a wide range of colors are available in Royalite, a thermoplastic sheet material

# of Many Uses

Available in a variety of colors and surface finishes and with a wide range of physical properties, new sheet is readily fabricated by standard techniques

Extremely tough and highly resistant to severe bumps, bangs, and abrasion, Royalite is suitable for mass production or specialty manufacturing. The material may be formed into intricate shapes, sawed, sheared, drilled, punched, sanded, sewed, cemented, and polished. In general, it is handled by the fabricator in much the same manner as acrylic sheet material. Forming may be done on a press delivering from 5 to 10 p.s.i., and vacuum equipment delivering 26 in. of vacuum. The grain finish of the flat sheet of stock will remain during forming unless intentionally pressed out; thus, post graining, finishing, painting, etc., are unnecessary.

Bonded or riveted

Because of the extreme toughness of Royalite, screws and rivets may be drawn tight without danger of fracturing the material. In an item consisting of several individual Royalite parts, supporting blocks and sections may be permanently bonded with methyl ethyl ketone (MEK) or with special cements supplied by U. S. Rubber. Finished products may be cleaned and waxed, or polished with suitable cleaning polish.

Distinctive designs or trademarks can be permanently hot embossed or stamped upon Royalite. Decorative patterns in any number of colors can be hand painted, spray stencilled, or hand stencilled with enamels containing the proper solvents. In addition, a variety of wood grains, marbleized effects, and other special finishes may be incorporated directly in the surface of the material through the use of lacquer transfer films.

Forming methods

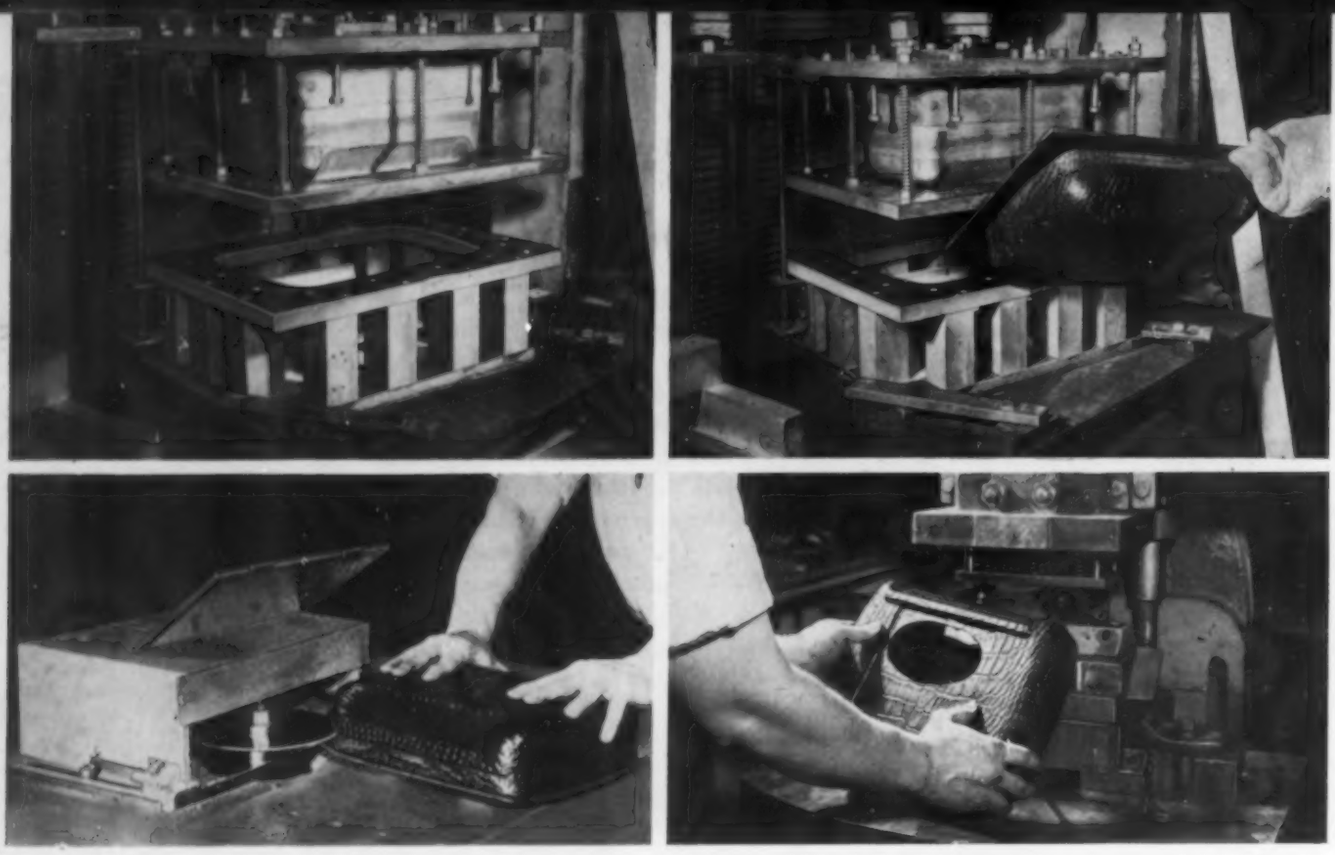
In forming, Royalite is heated to between 280 and 300° F. A number of forming methods familiar to most fabricators of acrylic produce satisfactory results, including straight vacuum, vacuum snap back, matched dies with mechanical pressure on both sides, plug and ring technique, or plug and diaphragm. In a variation of the plug and ring method, a male member may be used which has been drilled for vacuum. After pushing the male plug into the soft, preheated stock, vacuum is applied to the plug in order to draw the stock into any unusual contours present.

Dies of suitable wood, Masonite die stock, or any of the materials customarily used in forming acrylic sheeting are suitable for forming Royalite. In all techniques, a cold mold is used and the part should be permitted to cool to approximately 125° before removal from the forming fixture. This precaution guards against possible distortion. In some cases, a blast of air may be directed against the part to speed the cooling, while in some instances a water jacketed mold may be employed. The cooling time on Royalite formed pieces usually runs from 1 to 5 minutes.

The various grains and patterns in which Royalite

General Royalite Specifications

Property	*Temp.*	*Values for typical stock*		
	°F	*200 Series*	*300 Series*	*400 Series*
Rockwell hardness "R"	70	100	85	55
Specific gravity	70	1.08	1.07	1.05
Tensile strength (p.s.i.)	70	4,800	4,000	2,500
% elongation at fracture	70	30	60	75
Modulus of elasticity in tension	70	280,000	240,000	140,000
Flexural strength (p.s.i.) (modulus of rupture)	70	7500	6500	3000
Modulus of elasticity in rupture (p.s.i.)	70	210,000	190,000	110,000
Impact strength (Notched Charpy) ft.-lb./in. notch	70	5	15	12
(Notched Charpy)	20	1	5	11
(Notched Charpy)	0	0.8	1.5	10
(Notched Charpy)	—10	....	....	4
(Notched Charpy)	—20	....	....	1.5
% of moisture absorption (24-hr. immersion)	70	0.3	0.4	0.5
Thermal conductivity Btu./hr./sq. ft./ °F./in.	70-212	1.0	1.0	1.0
Heat distortion point (66 p.s.i.)		....	185°F.	170°F.	155°F



Sheet for radio cabinet is first heated to 280 to 300° F., and placed on ring mold (top left). Male plug shapes sheet and finished piece (top right) is removed. Edges are sawed off (lower left) and holes for screen, knobs, etc., punched (lower right). The grain finish is unimpaired by these operations

is available should be of particular interest to manufacturers and fabricators because they yield, in effect, a partially fabricated product, affording important savings in finishing operations. In addition, grained surfaces eliminate glare and largely eliminate the problem of surface scratching.

Applications

One of the first important non-military items made of Royalite was the Bishop refrigerated food shipping container, made up of inner and outer walls of Royalite with the interior space filled with Flotofoam, a foamed urea product also made by U. S. Rubber. Measuring approximately 33 by 32 by 27 in., the "Lifetime" container, used for bulk shipments of fresh and frozen foods, easily withstands the impacts of shipment; tests indicate its ability to survive more than 1000 trips in normal usage. Noncorrosive, waterproof, vapor-proof, and easily cleaned, the container requires no protective coating of any kind. The container, when empty, weighs only 75 lb., whereas a steel container of equivalent construction, strength, and capacity, insulated with cork, would weigh over 300 lb. and still lack durability because of eventual corrosion.

Luggage is a "natural" for Royalite. One of the major luggage concerns is planning to introduce an entire line of Royalite luggage in the near future. The portable radio cabinet brought out by Philco in 1948 is luggage-styled and neatly capitalizes on the appearance of the alligator finish material. Accessory rear fender guards for Studebaker trucks, formed in a two-cavity die, indicate the type of tough service for which Royalite is suited.

Newel posts for bowling alleys, formed in two halves and cemented into a single unit, are another application which has proved highly successful. Harley-Davidson Motor Co. is using formed Royalite saddles, with a layer of sponge rubber beneath, on some of its new model motorcycles. Here the waterproof qualities and excellent aging characteristics of the material, combined with its pleasant feel—one of the softer grades is used—make this a very sound application.

Bowls for food mixers are easily formed of Royalite and are now under investigation. These could be made in a series of pastel colors to match any kitchen decorative scheme and would be virtually indestructible in normal service. A hair drying hood for beauty parlors, drawn from thin-gage material, is attractive in appearance and does not become unpleasantly hot to the touch. A large Chicago bakery has had excellent service from specially designed Royalite truck racks in which a number of pies may be carried directly into restaurants and other eating places.

Bowling bag and golf bag bottoms, aircraft window frames and food service trays, football helmets, shoulder guards, shampoo head rests, automatic pencil sharpener housings, gasoline containers, instru-

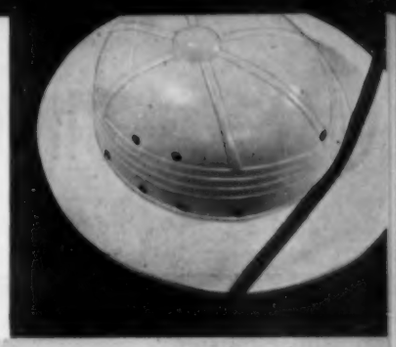
ment panels, liners for refrigerators and frosted food cabinets, typewriter cases and tote boxes for industrial plants illustrate other current or contemplated outlets for Royalite. Also, there are sinks for aircraft, trailers, and other vehicles in which light weight is important. Royalite "gutters" beneath billiard tables have plenty of strength to withstand the constant rolling of billiard balls and are also quiet in use.

Large formed parts

Among the largest and most interesting parts being fabricated of this material are motor coach wheel housings, customarily drawn from sheet metal and involving very expensive tooling. The Royalite housings are quieter, have greater resistance to impact and puncturing, and require no periodic refinishing, since the color goes all the way through. They also avoid the cold, unfriendly "feel" of their metal counterparts.

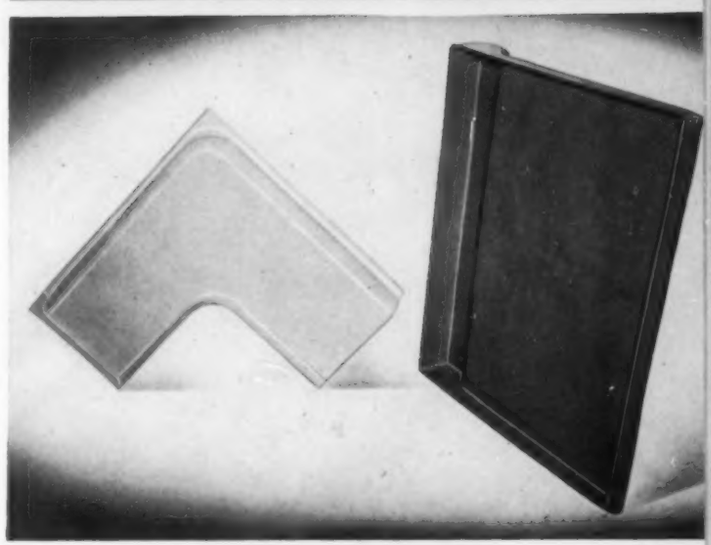
In its expanded form, produced by means of a vulcanizing operation, Royalite takes on a board-like appearance. Floats for pontoons, anchorage buoys, insulation, soundproofing, and tropical helmets indicate typical uses for the expanded material. Another new application involving the expanded material consists of a formed insulating chamber used on an automatic coffee dispenser, which keeps the cream and coffee concentrate supply cold for many hours even though it is located in close proximity to the hot water. Expanded Royalite is formed or drawn with the same ease and simplicity as the solid material.

Since Royalite is relatively new to most fabricators, U. S. Rubber, in addition to supplying the material, is also handling some custom fabricating projects in its own plant. Essentially, these are products involving complex forming or other problems requiring detailed knowledge of the properties of the material. This company activity, carried on in connection with a continuing development program for Royalite, may gradually be discontinued after sufficient "know-how" has been acquired and can be passed along to custom fabricators.



Tropical type helmet formed of expanded material has good detail and insulating properties

Formed thermoplastic sheets are used for luggage, doll carriage top and body. Child's scooter in the shape of seal is drawn



Sample sections of kitchen counter tops indicate design possibilities. Material can be formed with a finished cove and even "around" corners, obviating two-piece construction

Chemical resistant, 80 qt.-capacity mixing tub points up use of material in such fields as food processing

Standard types of equipment can be used in finishing material. Here ensemble for bowling alley, formed in two halves, receives final buffing and polishing

Child-Scaled Vacuum Cleaners

Bizzie Bee toy cleaner has vinyl dust bag and phenolic motor housing. Upper photo shows phenolic inlet into which dust is drawn. Below: Housing with ventilating slots

FOR industrious young ladies who like to play house and help Mother with her daily chores, two toy vacuum cleaners that actually work are now available. Plastics give both cleaners a smart, modern appearance and make them safe for children to use. Such child-scaled replicas—in looks, sound, and operation—of familiar household devices, are rapidly becoming big sellers in the toy field.

The Bizzie Bee vacuum cleaner, illustrated above, was originally designed with a steel motor housing. However, the manufacturer, the Woodburn Mfg. Co., Inc., Chicago, Ill., decided to restyle the toy to bring it into line with modern trends in design as well as materials. Re-created by the industrial designing firm of Charles E. Jones & Associates, Chicago, Ill., the new Bizzie Bee is a far cry from its predecessor. Utilizing a sleek black phenolic housing closely simulating a full-sized vacuum cleaner, the toy sets a new standard for this type of merchandise. Replacement of the steel housing made possible a simpler assembly and increased buyer appeal.

The housing, molded of general purpose phenolic in a two-cavity die by Imperial Molded Products Corp., Chicago, Ill., incorporates a number of simplified design features. Ventilating slots, cored directly into the top of the housing, provide escape for the generated motor heat. Baffles protect the electrical parts so that an inquisitive child cannot reach through the slots and receive a shock. Located beneath the motor is a phenolic inlet, molded by Imperial in a six-cavity die, into which the dust is drawn.

As a further safeguard, assembly of the working mechanism to the lower side of the heavily ribbed, cored housing is by means of flush-head drive screws which cannot be removed by exploring young fingers. Because a more efficient air scroll could be designed into the plastic housing than was possible with the metal assembly, a motor with only one-third the power of that previously used can be employed without any change in performance.

The cleaner's motor mount is fabricated of a Bakelite phenolic laminate that is supplied by the Federal Insulation Co., Chicago, Ill. Solid fiber material in sheet form, fabricated by Felt Products Mfg. Co., Chicago, Ill., is used as a cover for the curved air scroll.

Among the many features which make the toy "just like Mother's" are its built-in headlight (which really lights), the curved handle of aluminum tubing that can be raised or lowered, and the dust bag that fills with air when the toy is in operation. Fabricated of sheet vinyl by the Bearse Mfg. Co., Chicago, Ill., the dust bag has a cloth seam down the front to provide escape for the built-up air pressure. The toy has been granted the approval of the Underwriters Laboratories.

Two-color toy is 32½ in. high

The other child-scaled vacuum cleaner is called Tidy Miss and is a product of the National Scientific Products Co., Chicago, Ill. The neatly styled, two-

color toy stands 32½ in. high and is also approved by the Underwriters Laboratories. The cleaner, which has an automatic handle-controlled on-off switch that operates the motor and the electric headlight, has eight plastic parts: the housing cap, the headlight window, the housing base, the impeller, the base cover, the power cord strain relief clamp, the switch insulators, and the pilot lamp insulator.

The cap is molded by the Continental Plastics Co., Chicago, Ill. Monsanto polystyrene was chosen for this part because of its low cost and high heat resistance. The brightly colored cap has molded-in barriers, which are placed around the handle fork opening and between the light and motor compartments, to prevent accidental access to the motor compartment. The cap is fastened to the base by Tinnerman Speed-Nuts which grip six 3/16-in. diameter projections molded as part of the cap. A groove in the cap allows insertion of the window, which is fabricated from rigid Vinylite sheet stock by the Tingstol Corp., Chicago, Ill. There is a notch in the transparent window so that it can easily be removed to replace the pilot lamp.

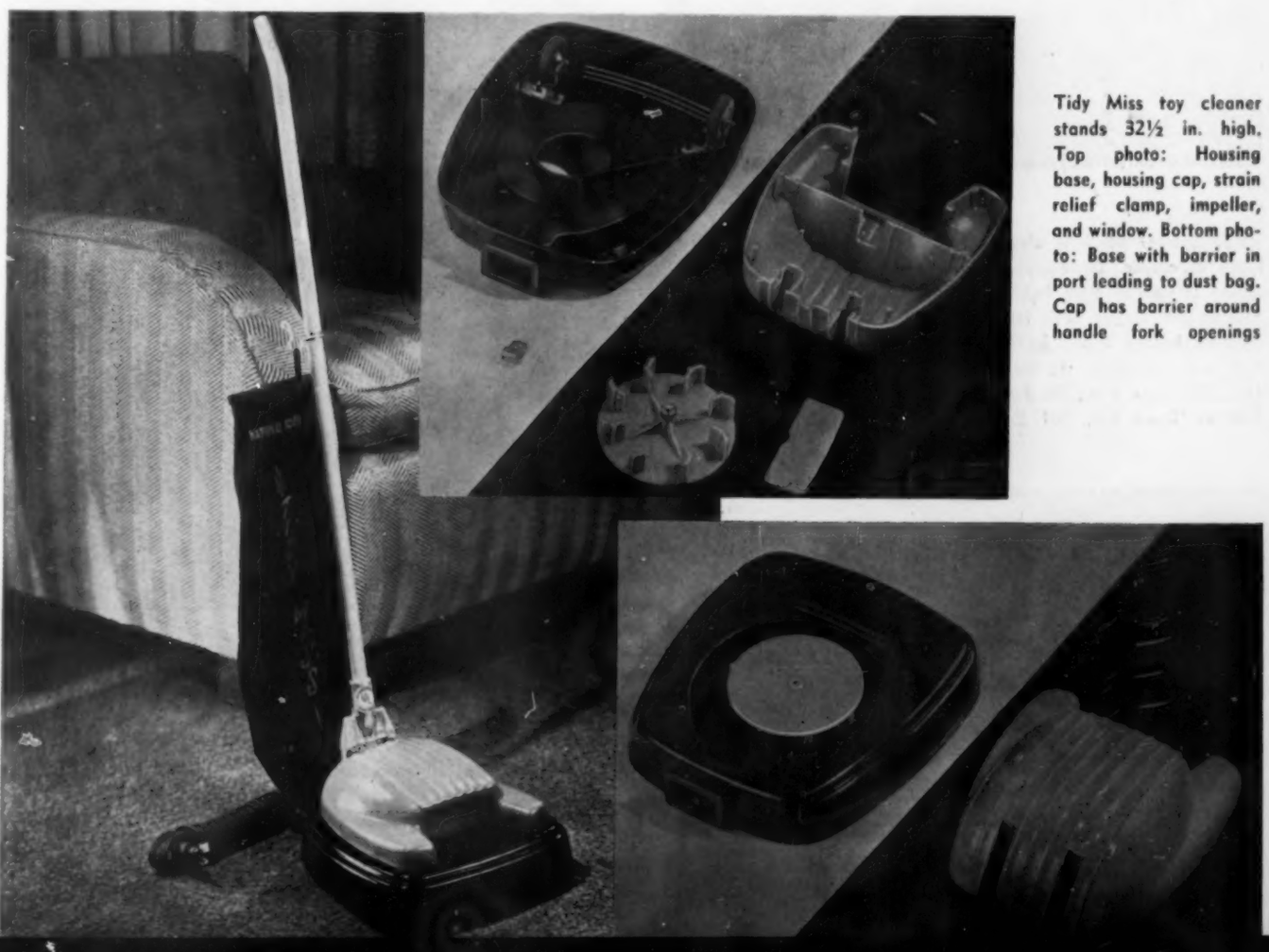
Cellulose acetate butyrate, Tenite II, is used for the base and was chosen primarily for its high impact strength. The base, also produced by Continental, has four molded-in studs that are slipped through holes in the wheel brackets and fastened with Tinnerman nuts. Located on the base are seven hollow bosses—six around the periphery and one in the center. These bosses form the receptacles for Cinch Trimounts that are pushed through the base cover. The groove which forms the lower portion of the window frame also provides a strong forward support for the motor mounting plate and relieves impact strains on the bosses used to secure the mounting plate. A barrier is provided in the port leading to the dust bag to prevent children from getting their fingers into the impeller blade.

The impeller, molded of polystyrene by Continental, is fastened to the motor shaft by means of a spring ring. There are four ribs in the impeller to prevent warpage. The hub of the impeller has three slots to assure good alignment.

The base cover, made of vulcanized fiber, is fabricated by Lamicoid Fabricators, Inc., Chicago, Ill. The use of this material is said to relieve some of the shock on the butyrate base when the toy is bumped into walls or furniture.

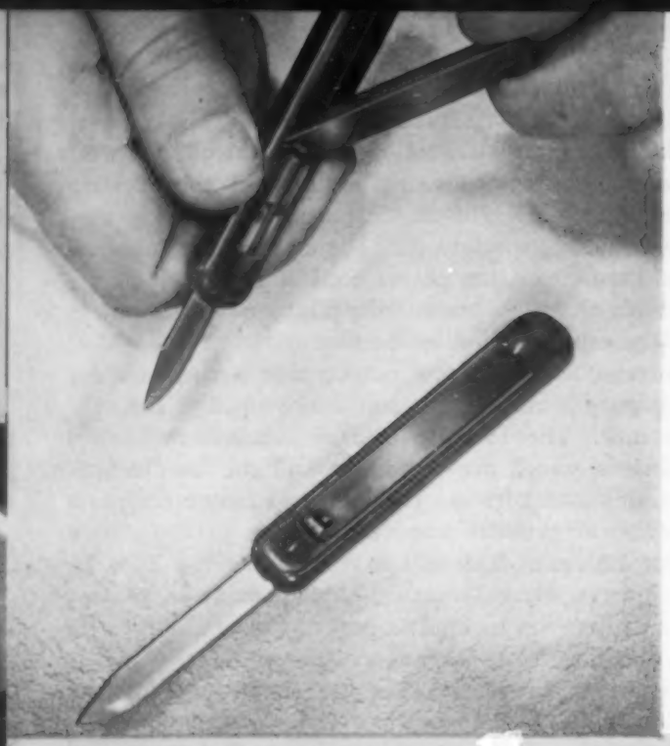
Ethyl cellulose, fabricated by the Commercial Plastics Co., Chicago, Ill., is used for the power cord strain relief clamp because of its good insulating properties and resistance to breakage. Other plastic materials include phenolic sheeting for the switch insulators and vulcanized fiber for the pilot lamp insulator.

National Scientific reports that it is producing approximately 1200 units per day on a straight line production process. Well over 44,000 units have already been produced.



Tidy Miss toy cleaner stands 32½ in. high. Top photo: Housing base, housing cap, strain relief clamp, impeller, and window. Bottom photo: Base with barrier in port leading to dust bag. Cap has barrier around handle fork openings

Pocket knife has panel which flips up and swings over to eject or sheath the blade. Panel snaps shut to lock the blade in either closed or open position. Both sides of the panel, as well as other side of handle, can be used to carry advertising copy. Handle is molded of Tenite II cellulose acetate butyrate. Knife, called the King Kut, is produced by Unsinger-AP Corp., 1801 Spielbusch Ave., Toledo, Ohio



PLASTICS

A single measuring spoon which does the job of four is made of polystyrene. It can be used to measure either a tablespoon, a teaspoon, or (on the reverse side) ½ teaspoon or ¼ teaspoon. The measurement is molded into the handle next to each bowl. Company name or advertising copy can be imprinted on side of the handle. The 4-in-1 spoon is injection molded of red, blue, green, or clear Styron by Columbus Plastic Products, Inc., 1625 W. Mound St., Columbus, O.

House number which is clearly visible by day or night is made of acrylic. Dome-shaped translucent white Plexiglas casing is lighted from inside by 12-volt bulb at average cost of only 1c per week for 24 hours a day. Unit, known as Illum-Addrex, is 9½ by 4⅛ by 2 inches. Numbers 2 in. high are cut from 1/16 in. black acrylic sheet. Plastics, Inc., 224 Ryan Ave., St. Paul, Minn., makes the casings. Sold by Dome Co., 401 Endicott-on-4th Bldg., St. Paul

Blinking light electric alarm clock wakes a sleeper silently without disturbing the rest of the family. If the flashing light is ignored, an audible reserve alarm takes over. Housing is molded of white translucent cellulose acetate butyrate by Chicago Molded Products Corp., 1020 N. Kolmar Ave., Chicago, for Westclox Div., General Time Corp., La Salle, Ill.

Handbag is made of Velon vinyl film and multicolored striped fabric woven of vinylidene chloride yarn. Both materials are resistant to scuffs and stains, and can be cleaned with soap and water. The striped fabric is woven of Velon yarn by Gordon Textile Co., Inc., 141 W. 17 St., New York. Made by Marlow Handbag Co., 366 Fifth Ave., New York

PRODUCTS

Lightweight fabric sports jacket, designed specially for yachtsmen, fishermen, and hunters, has built-in inflatable Vinylite life preserver. The hidden life preserver can be quickly and easily inflated by mouth in an emergency. The preserver extends from either side of the chest around the neck. A drawstring around the waist keeps the jacket in place when used in the water. Neptune Specialties, Inc., 190 Columbia Heights, Brooklyn, N. Y., manufactures the complete jackets

Charga-Plate addresser, used in department stores to record charged sales, gets a lot of rough handling. The handle and housing can withstand high impact and will not chip because they are molded of Tenite II cellulose acetate butyrate. Available colors match store interiors. Molded by Auburn Button Works, Inc., Auburn, N. Y., for Farrington Mfg. Co., 76 Atherton St., Boston 30, Mass.

Individual ice cube cups molded of Bakelite polyethylene have depressions on each end so that water above the proper level automatically drains off. Cubes freeze rapidly because cups' walls are thin; cubes can be released easily because cups are flexible. Anodized aluminum tray holds 12 plastic cups. Made by Plastray Corp., 823 Fisher Bldg., Detroit 2, Mich.

Water, iced tea, or other summer drinks can be kept cool in the Top-A-Glass, molded of transparent heat-resistant Styron polystyrene. The dispenser measures 5 by 5 by 10¾ in. and holds over a gallon. The tray top is removable for easy cleaning. The body has molded-in hand grips. Molded by George A. Coleman Co., South San Francisco, Calif.; distributed by Bart-Kinnison Co., 1355 Market St., San Francisco, Calif.

PLASTICS

Shoes and sheer nylons can be protected from rain, slush, or mud by overshoes fabricated of Vinylite. The overshoes, made of a clear material, come in a convenient carrying bag made of vinyl in colors to match rainwear. Vinyl film 0.008 in. thick is used for the body of the overshoe, 0.030 in. film for the inner sole, and 0.040 in. material for the wearing sole. All seams are electronically welded. Made by S. Buchsbaum & Co., 1737 S. Michigan Ave., Chicago 16, Ill.

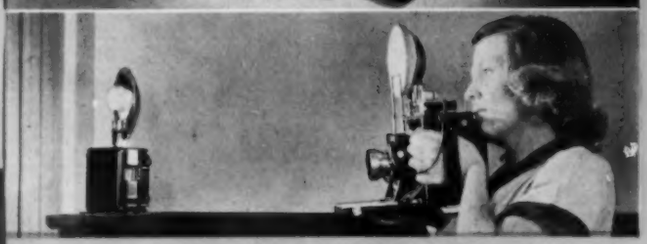
Soap dispenser has container molded of translucent white Lustrex polystyrene. The container holds more than a pint of liquid soap and the level of soap is always visible. Polystyrene was chosen because it is impervious to the chemicals used in soaps. The plastic container is molded by eaRBee Plastic Co., 5112 W. Jefferson Blvd., Los Angeles 16, for Bobrick Mfg. Corp., 1839 Blake Ave., Los Angeles 26

Lengths and angles of all roof rafters can be calculated quickly and accurately with instrument made of rigid Vinylite sheet. The instrument can be used to design a roof with any pitch from 14 to 57°. Only 6¼ by 8¼ in. and weighing less than two oz., it can be easily tucked into a pocket or tool box. An instruction booklet is supplied with each instrument. Made by Edward Weyer, 40 W. 77th St., New York 24

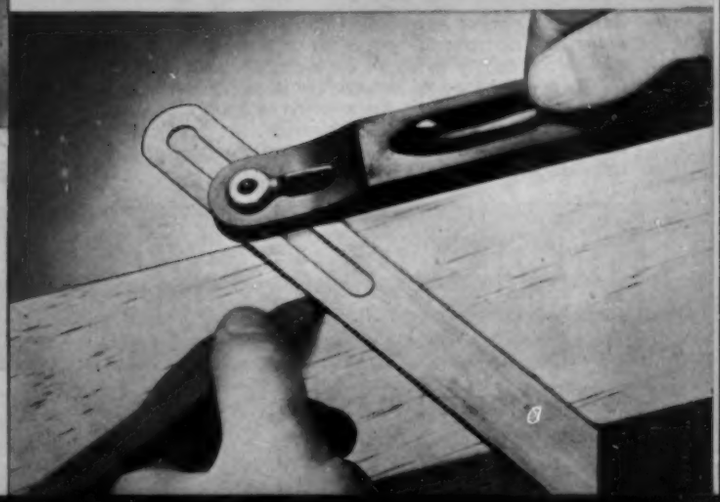
Fishing line drier made of polystyrene is easy to use and folds flat for compact storage. Reel clamps on base of the drier and feeds the line onto vanes which keep line spread apart for quick drying. Prevents the corrosion which often results when the line is allowed to dry on the reel. Molded by Plastic Processing Co., 2210 S. Dort Highway, Flint 1, Mich., for Living Designs, 2521 Fenton Rd., Flint 3

PRODUCTS

Servo-Flash unit provides side lighting for flash photographs without the need of a connecting wire between the two flash bulbs. Flash of master bulb on camera is picked up through window and "slave" bulb is fired instantly by electronic circuit. Durez phenolic housing of unit has molded-in holes, assembly bosses, lettering, and fluting. Molded by Harry Davies Molding Co., 1428 N. Wells St., Chicago 10, for Era Tool and Engineering Co., 8301 Belmont Ave., Franklin Park, Ill.



Toothbrush designed to make children enjoy brushing their teeth has a built-in whistle which can be blown to announce the completion of the task. Brush is molded of Lumarith cellulose acetate. Holes for the whistle are molded-in to the main piece and a second molded piece is cemented in to bring the blowing hole down to the proper size. Molded by Prolon Div., Pro-Phy-Lac-Tic Brush Co., Florence, Mass.



Carpenter's bevel has stock molded of durable, light weight Tenite I cellulose acetate. Stock is molded in two halves and bonded together at one end, leaving a groove to hold the blade when not in use. The acetate stock, will withstand hard usage, and is molded to close tolerances to assure a straight side. Molded by T. F. Butterfield, Inc., Naugatuck, Conn., for Southington Hardware Mfg. Co., Southington, Conn.

delivery?

AT MIDLAND IT'S FASTER THAN A CAT CAN HAVE KITTENS!

This wall socket hobbed cavity by Midland incorporates two narrow "T" projections raised 3/16 inches above the cavity surface. By using hobbed cavities of this type in place of the conventional insert cavities, all unsightly parting lines were eliminated and in addition to improving appearance, the hobbing was accomplished at only a fraction of the cost of cavity duplication by machining methods.

Yes, actually! It takes a cat nine weeks—and on most hobbed cavity jobs we do a *lot* better than that! Our skilled craftsmen, our machining, engraving and hobbing equipment are working constantly, accurately on a schedule that means delivery of hobbed cavities in a matter of weeks —not months. Whenever you order from Midland you are assured the kind of accurate, uniform, perfectly finished hobbed cavities that only skill and experience can provide.

So if limited molding capacity and long quoted delivery are holding you back, grab the problem by its neck and bring it to Midland where delivery is shaved to a cat's whisker.

For a clear picture of our equipment and our know-how, write for a copy of "Shaping Tomorrow Today." Better still, send your blueprints!

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D&E

Extrusion of Polyethylene Film

Any good extruding machine can be set up to produce film by either sheet or inflated-tube extrusion

Successful production of polyethylene film by extrusion is an accomplished fact today, despite a dearth of general knowledge regarding the processes. The accompanying article emphasizes some of the little known details, tells of the problems encountered and outlines their solutions.

USES for polyethylene film ranging from 0.0005 to 0.005 in. in thickness have multiplied many times during the past year. The greatest increase has been in the packaging field where this inert, non-toxic material, having a very low rate of moisture vapor transmission, is being used to package vegetables, meats, poultry, live plants, and other merchandise, the value of which is maintained if the moisture content does not drop appreciably during shelf life.

There are at least four methods of producing thin polyethylene film: 1) by calendering; 2) by casting; 3) by sheet extrusion; and 4) by large-diameter tube extrusion.

Calendering and casting processes are well known. However, sheet extrusion and large-diameter tube extrusion methods of producing thin polyethylene film are relatively new processes and the few companies now engaged in this work are naturally reticent about their operating methods. Hence there is little reference to film extrusion techniques in the literature. The present article presents basic details on the manufacture of thin wall film by extrusion.

Sheet extrusion

For sheet extrusion up to 72 in. or wider, any good extruder fitted with a die about 2 in. wider than the desired finished product will prove satisfactory. The extruder should be efficiently heated and equipped with accurate temperature control systems, if a uniform product is to be produced. The die itself, of rugged construction to prevent leakage under pressure, should be equipped with heaters, the adjustment of which is one of the factors in controlling the thickness of the sheet. Best results are usually obtained when the die is electrically heated.

The construction of a die having an opening possibly 0.005 in. wide by 72 in. long requires tool making ability of the highest order. The slot must be absolutely uniform over its entire length. No cost-saving short cuts can be permitted in the construction of such a die. Second in importance only to the dimensional accuracy of the die is the uniformity of temperature over the entire die length. The heating elements should be disposed along the die so that there will be no more than a 2° variation in temperature throughout the die.

In addition to the special die on the extruder, a water trough about a foot deep and a foot longer than the width of the sheet is required. It is adjustable for height so it may be lowered while changing dies. A ½-in. inlet plus a 1-in. drain is needed to properly control the water flow in this trough. Mounted in the trough is a roller which serves to carry the sheet under the water.

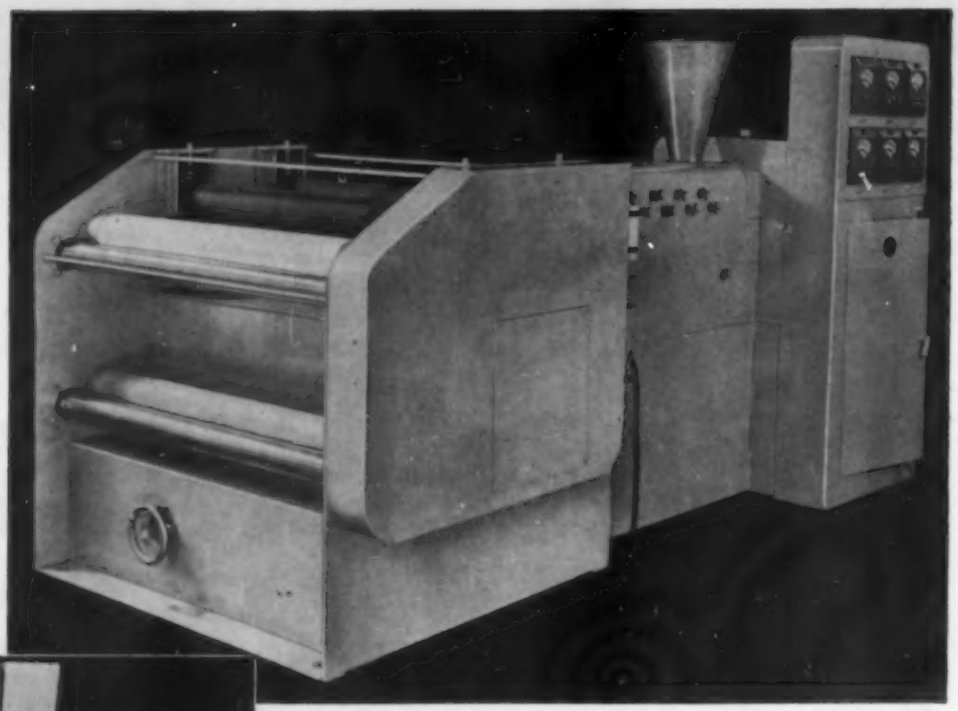
Other equipment needed for sheet extrusion includes a driven pair of rubber covered pinch or pull rolls, two sets of rubber covered trim rolls, a set of rotating trim knives, and take-up rolls.

Temperature adjustment

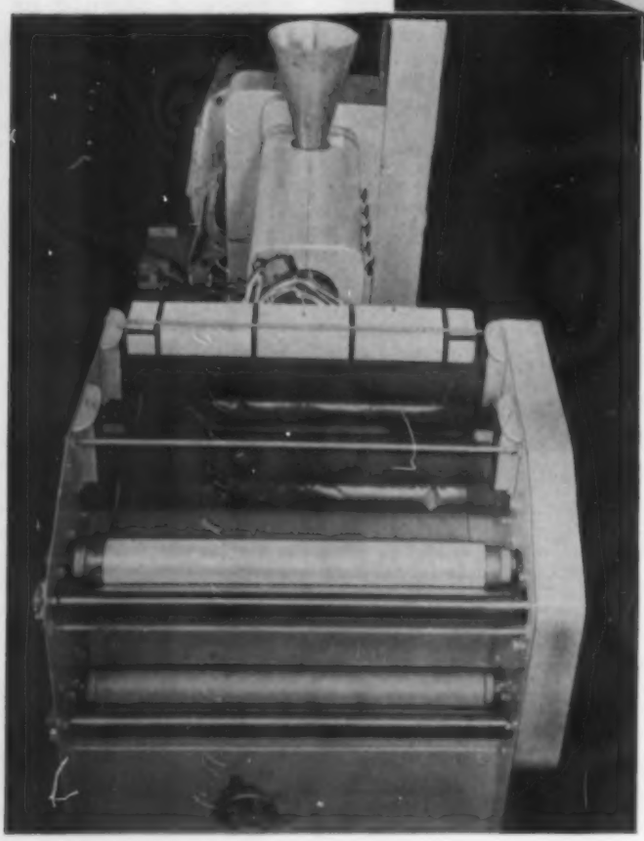
For producing uniform polyethylene sheeting approximately 0.003 to 0.004 in. in thickness, the extruder and die temperatures of a four-zone extruder, for example, are set as follows: the hopper

*Reg. U. S. Patent Office.

Complete unit for production of film by sheet extrusion method consists of control cabinet (far right), extruder, and equipment for cooling, conveying, trimming, and rolling up the finished film



End view of sheet extrusion unit shows the two wind-up rolls. The unit shown has a 2½-in. extruder and can process 85 lb. per hr. at 80% of capacity. At that rate, the unit will produce 4-mil film 36 in. wide at a rate of 54 ft. per min.



PHOTOS COURTESY MODERN PLASTIC MACHINERY CORP.

end is held at 350° F., the next zone towards the die at 380° F., and the die zone plus the die itself at from 400 to 430°, according to the thickness of film desired. For best results, the feed hopper should be water cooled.

When the various zones come up to temperature, the extruder is started at a comparatively slow speed. As the film begins to issue from the die, it is manually carried down into the water trough and underneath the roller. Just previous to starting the operation, the water trough should be raised so that the surface of the water is approximately 1 in. below the die. As the film continues to issue from the die, the operator, keeping a slight strain on the material, passes it between the pull rolls. He continues to carry the end of the sheet through the first set of trim rolls and thence between the rotary trim knives to the second set of trim rolls. The sheet is then given two or three turns around a paper tube take-up roll.

Take-up roll

The take-up roll rides between two driven steel rolls, set approximately 3 in. apart. As the diameter of the film on the roll builds up, surface speed does not increase because the roll is riding between the above-mentioned rollers which have a speed slightly greater than that of the rubber pull rolls.

From this point on, the thickness of the sheet should be the only variable remaining, if the die temperature is uniform from point to point, the water temperature in the trough does not vary, and the speed of the extruder is held constant.

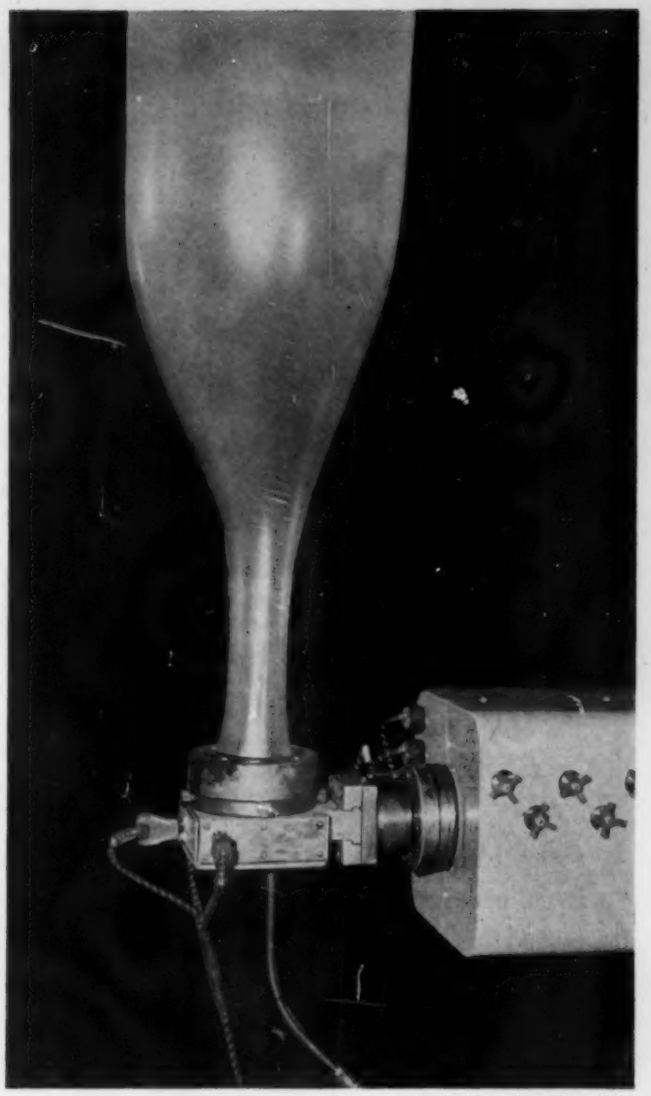
The thickness of the sheet can be decreased by increasing the speed of the pull rolls (pulling it away from the die faster while the extruder screw speed remains constant); this will stretch the film and make it thinner. Conversely, reducing this speed will make the film thicker.

As soon as the operation has proceeded for a short time, it is possible to speed up the extruder to its maximum capacity. In so doing, however, the take-off and roll-up mechanism must be speeded up in order to hold the thickness at its required dimension. With all functions of this equipment operating nor-

mally, there should be little work for the operator beyond keeping a supply of material in the hopper and changing over to a second take-up roll when the first one becomes filled to capacity.

Inflated tube extrusion

In contrast with sheet extrusion of thin polyethylene film, inflated-tube extrusion, the newest of all methods, does not require a large die. It is simpler to produce a die for this method and the adjustment of the center pin for producing uniform wall thickness is quite easy. Like sheet extrusion, inflated tube extrusion can be done on any good extruder, but water cooling is not necessary in the latter process. The tubing is extruded vertically, either upward or downward, and passes from the die to a pair of idling squeeze rolls. These squeeze rolls are adjustable as to their distance from the die. The equipment must be designed so that this distance may be varied up to 10 or possibly as much as 12 feet.



COURTESY BAKELITE CORP.

Close-up of 4-in. die on 1½-in. extruder with tubing inflated to 16 in. diameter to produce film 1 mil thick

COURTESY BAKELITE CORP.

First steps in inflated tube method involve carrying uninflated tube between squeeze rolls to conveyor and roll-up

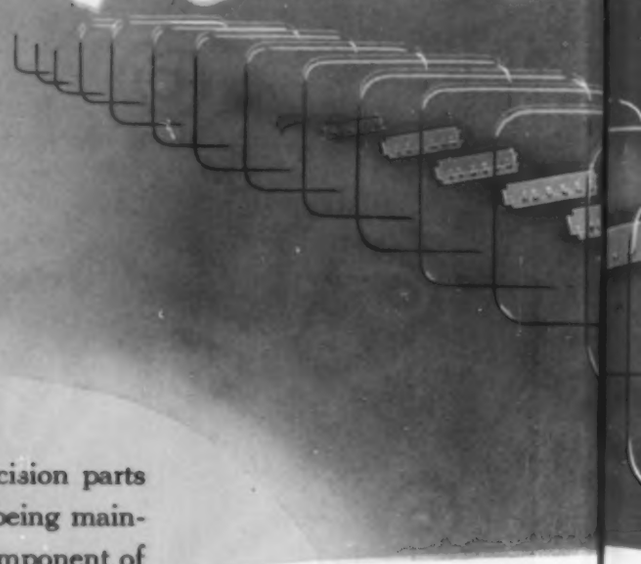
The tubing passes from the squeeze rolls to a pair of rubber covered pull rolls and then through two additional sets of rolls between which are mounted the rotary trim knives. It is then carried to a take-up similar to the one discussed previously except that two sets are required because two sheets are produced simultaneously.

In producing sheet from tubing the trim knives are adjusted so that they cut the outer edges of the flattened tube. The small amount of scrap can be immediately fed back to the extruder for re-working. If continuous lengths of thin wall tubing are desired instead of sheeting, the material can be carried directly from the first set of pull rolls to the roll-up mechanism.

In operation, the extruder and die temperatures

(*Please turn to page* 102)

30 Heart



From Plaskon Alkyd Molding Compound to high precision parts in 30 seconds! That's the remarkable production pace being maintained for these urgently needed parts. The part is a component of "The Standard Tuner" made by Standard Coil Products Company for television sets. In "The Standard Tuner", extreme accuracy is of the utmost importance... tolerances on the Plaskon Alkyd molded parts are held as low as .0005".

These parts for "The Standard Tuner" are produced in an eight-cavity mold using a total pressure of only 4,000 pounds. Cure time is about 16 seconds. However, in some cases other types of parts made of Plaskon Alkyd are...in, cured and out in as fast as 8 to 12 seconds.

Plaskon* Alkyd is an exclusive new Plaskon plastic—a thermosetting mineral-filled molding compound that has many outstanding advantages. It has high arc resistance, heat resistance, chemical and solvent resistance. And it has remarkable dimensional stability.

The many features of Plaskon Alkyd Molding Compound may enable you to effect unusual economies or developments in your products. An experienced Plaskon Service Engineer will be glad to discuss it with you or your molder. Just write and tell us when he should call.

*Reg. U. S. Pat. Off.

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Manufacturers of Molding Compounds, Resin Glues, Coating Resins

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t beats Apart

This is "The Standard Tuner" made by Standard Coil Products Company, Chicago, Illinois, and Huntington Park, California. The parts are molded by Wilcox Plastics, Los Angeles; Mayfair Molded Products Company, Chicago; and Trans-Matic Plastics Company, Chicago, from Plaskon Alkyd.

are set at the same readings as those required for the production of sheet. The extruder is started and, as the tube issues from the die, the operator pulls it, keeping a slight strain on the tube until he has sufficient length to pass the end through the set of squeeze rolls which are mounted at a distance above the die.

The operator then pulls the tubing down until he has sufficient length to pass it through the first set of pull rolls and thence through the trimming and wind-up mechanism.

Air blown into tube

At this stage in the operation the tubing will be approximately the same diameter as the die. This die, however, is equipped with a small pipe so arranged that air can be blown into the inside of the tube. As air is admitted under pressure to the tube, it is trapped within by the squeeze rolls. The operator continues to admit more air until the tube has been stretched to the required diameter. It is of the utmost importance that this air be blown into the tube at a uniform rate. Surges of air will create bulges in the extruded tube and, as these bulges pass through the squeeze rolls, the sudden rise in internal pressure will cause a second bulge just above the die. If this occurs it is necessary to slit a hole in the tube, permit the air to escape and then repeat the operation of admitting air after the ruptured portion of the tube has passed beyond the squeeze rolls.

As in the case of the sheeting operation, the extruder speed and take-off mechanism are then brought up to their maximum for continuous operation. If the tube does not have a uniform wall throughout its entire cross-section, this condition will immediately be apparent from the shape of the tube itself; the thinner section will bulge out more than the thicker section. This defect is corrected by shifting the position of the center pin in the die. Most dies are constructed so that this pin can be shifted by means of set screws. The operation of correcting for non-uniform wall thickness is greatly facilitated by the immediate change in the shape of the tube which occurs as the center pin is adjusted. Accuracy is obtained by visual inspection rather than by a measuring operation.

Volume of air constant

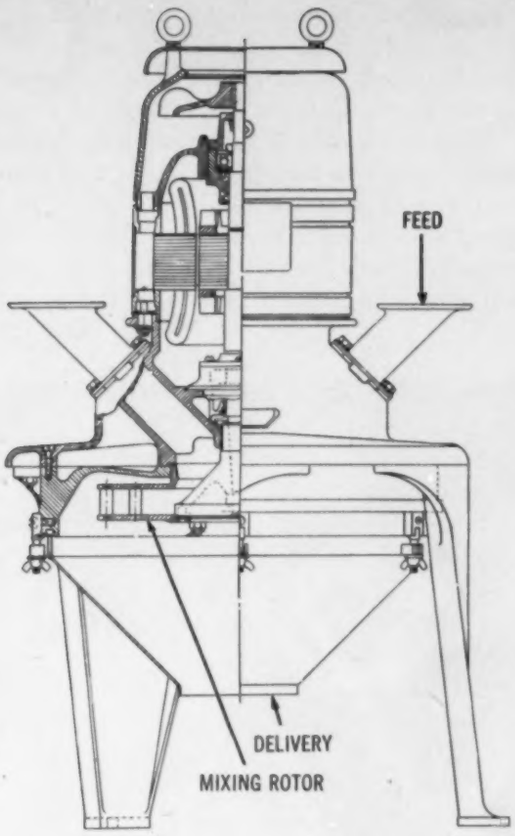
Once the cross-section of the tube is a perfect circle and the desired diameter has been reached through the admission of the required amount of air, no further variation in diameter will occur because the volume of air trapped between the squeeze rolls and the die cannot vary and the tubing does not have sufficient strength to compress it. Even though the diameter cannot be changed as long as the volume of entrapped air remains constant, the wall thickness can be varied by speeding or slowing the take-off mechanism as well as changing the speed of the extruder.

There is no doubt that both of these extrusion methods have their place in sheet production, with thicker material produced by a wide die and the inflated tube method manufacturing film ranging from 0.0005 to 0.002 in. in thickness.

COURTESY BAKELITE CORP.

When operation has reached an equilibrium, air inside tubing is trapped by pair of squeeze rolls; volume of air remains constant. Film 1 mil thick can be produced at a rate of 90 sq. ft. per min. with 4-in. die on 1½-in. extruder

Centrifugal mixer which requires only 12 cu. ft. of space is capable of producing finished mixes at the rate of 200 lb. a minute



Schematic drawing partially sectioned indicates location of various important components of this high speed mixer

Continuous Centrifugal Mixing

FOR years, some molders have compounded a few of the thermosetting materials used in their own plants. In recent months, a decided similar trend in "user" compounding and coloring of thermoplastics has been apparent. The processes for both classes of materials require a thorough pre-mix as one of the steps in the operation. This pre-mix serves the purpose of evenly dispersing all the ingredients; it follows that the more complete the dispersion the better the molded part.

A centrifugal-type mixer, old to the food processing industry but new to the plastics field has been found to aid greatly in obtaining uniform and intimate mixtures. Manufactured by the Entoleter Div., The Safety Car Heating & Lighting Co., Inc., New Haven, Conn., this unit has been used on a limited scale for both thermoplastics and thermosets with encouraging results.

The Entoleter[1] machine is approximately 3 ft. high by 2 ft. in diameter. It consists essentially of an especially designed high-speed mixing motor enclosed by a cast steel casing and driven by a directly connected enclosed motor. The rotor consists of two steel disks spaced about 1 in. apart by round rod-type supports which act as impactors.

The material to be mixed enters the Entoleter inlet, is fed to the center of the rotor, and is then spun out by centrifugal force into a spray, thinning as it approaches the perimeter of the rotor. Here the particles are subjected to severe impact, first, by the impactors mounted in the rotor and second by the high speed with which they hit the inside walls of the housing. The thoroughly blended material is then discharged by gravity.

There are various procedures for the manufacture of phenolic molding material, all requiring that the ingredients be pre-mixed. For example, a standard formula for a general-purpose molding compound consists of the following parts by weight:

45%	phenolic resin
5%	hexamethylenetetramine (hexa)
2%	dye or pigment
47½%	wood flour
½%	calcium stearate

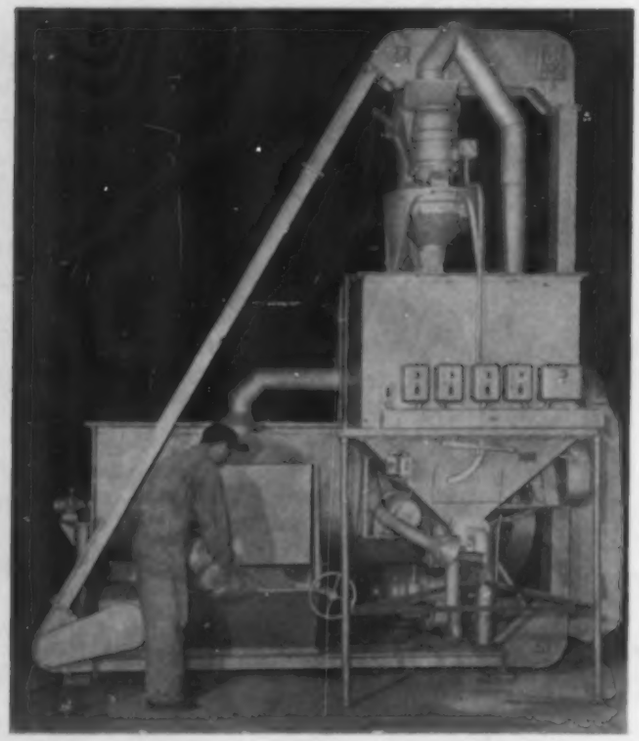
After thoroughly mixing these ingredients for

[1]Registered trademark of the Safety Car Heating & Lighting Co., Inc.

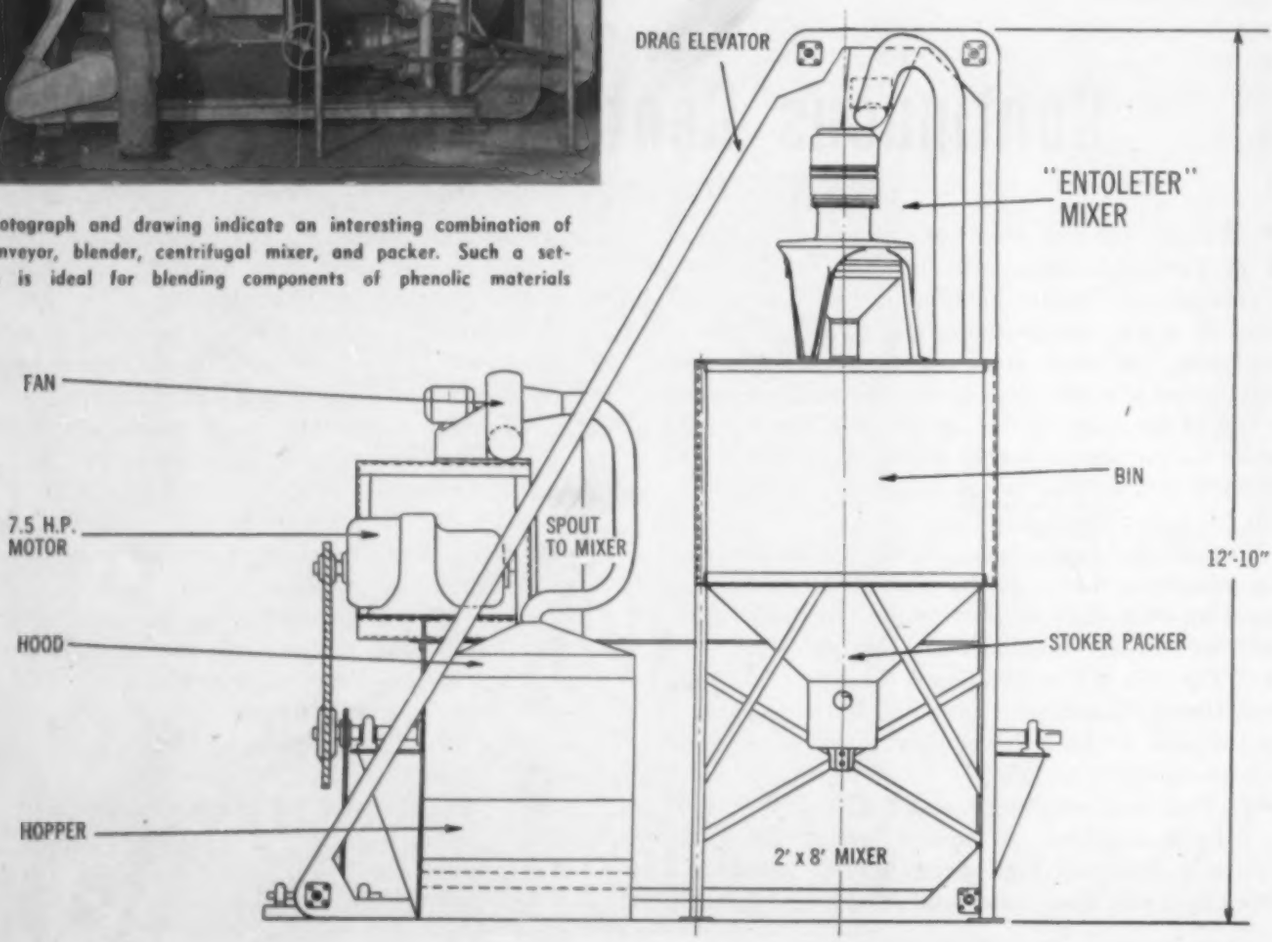
various lengths of time, depending on the type of batch mixer used, the material goes to a set of mills where it is kneaded and rolled into a uniform mass. It is then crushed, ground, and blended, after which it is ready for molding or pre-forming if required.

The Watertown Mfg. Co., Watertown, Conn., has installed one of these Entoleter mixers in its material compounding department. When a batch of pre-mixed material similar to the one above described was passed through the Entoleter before going to the mills, it was found that the time in the pre-mixer could be reduced by two-thirds with at least equal dispersion indicated in the final compound. The same results were apparent when a mineral-filler was used instead of wood flour. This uniformity of dispersion was checked both by chemical analysis and by microscopic examination. H. R. Sjostedt, chief chemist of Watertown, says: "There is no doubt in my mind but that the Entoleter will prove to be a very useful mixer in the plastic industry and help produce still more uniform products."

Welding Engineers, Norristown, Pa., manufacturer of a two-screw extruder, has a laboratory for working out problems in connection with compounding and coloring of thermoplastics by the use of its extruder. L. F. Street, research engineer for Welding Engineers, has found that in the dispersion of pigment in polystyrene preparatory to coloring and pelletizing the material in its compounder-extruder, the Entoleter has made a considerable contribution to quality over the processes previously employed. In his work with vinyls, Mr. Street concentrated on thorough dispersion and compounding of material with from 50 to 60% inert filler. He states that "preliminary indications are that there is a definite improvement in the quality of the product over that made by our previous methods." He summarizes by stating that the device shows a great deal of promise as a contribution to improved mixing which is required for their type of work.



Photograph and drawing indicate an interesting combination of conveyor, blender, centrifugal mixer, and packer. Such a set-up is ideal for blending components of phenolic materials



Westinghouse watt-hour meter terminal block: MELMAC 1500, Molded by Hemco Plastics Div., Bryant Electric Company.
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COURTESY R.C.A. VICTOR DIV., RADIO CORP. OF AMERICA

1 — Interior view of a portion of a television receiver showing the picture tube held rigidly in position by the television tube support

2 — The molded melamine television tube support, below, indicates the sturdy construction required for this part

COURTESY MACK MOLDING CO., INC.

Integral Plunger Molding

Long material flow required for producing complex piece is made possible by use of mold plug which functions after mold is closed

IN one of the latest projection type television sets produced by R.C.A. Victor Div., Radio Corp. of America, it was necessary to develop a support which could be depended upon to hold the picture tube rigidly in position at all times. In this set, the image is prefocused at the assembly plant; once this has been accomplished, the tube must hold its position within 0.002 or 0.003 inch. Otherwise, the projected picture will become distorted on the television set screen.

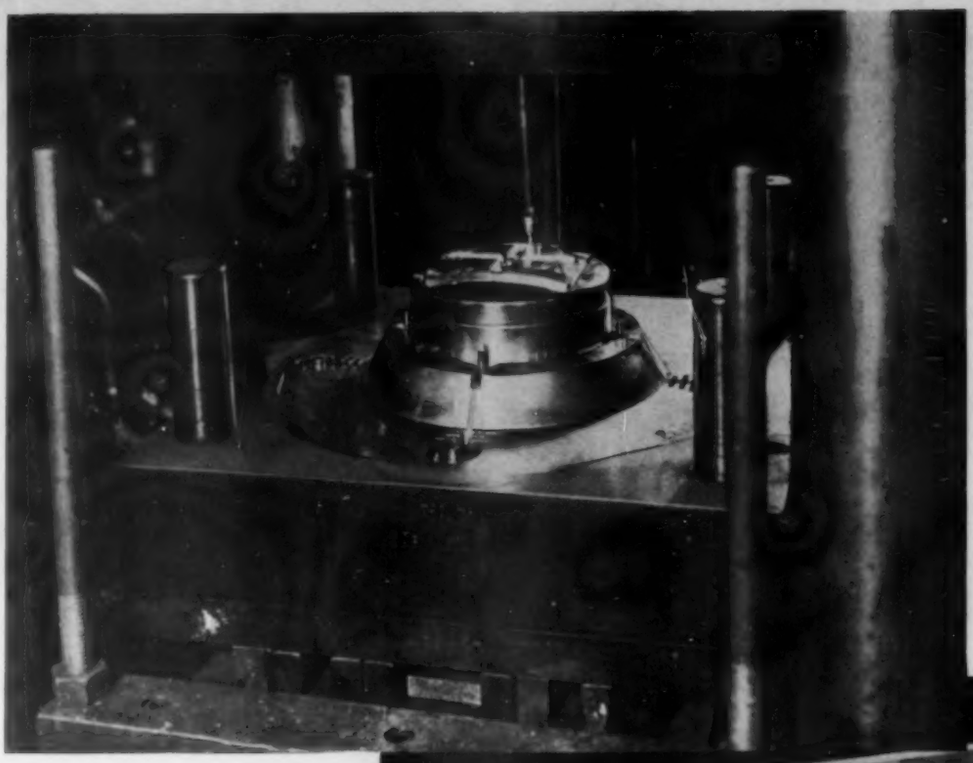
Inasmuch as the support is in direct contact with the high voltage picture tube (Fig. 1), an added requirement was that the material used in it must be a good dielectric as well as have excellent resistance to tracking. Alpha cellulose filled Melmac was the answer. Even this material required a special coating in order to eliminate any possibility of the 28,000 volt potential creating a corona discharge between the tube and the mounting lugs of the melamine support.

Leg barriers increase surface distance

Inasmuch as corona and arcs generally travel along the surface of an insulator in order to reach "ground," it is usual practice in the electrical industry to increase this surface distance by interposing barriers between the points of high electrical stress of the insulator and its points of contact with ground. This design feature was accomplished on the three legs of the television tube support by including three rectangular barriers on each leg (Fig. 2). When the blue print of this part was given to the tool design department of Mack Molding Co., Inc., Wayne, N. J., it was at first thought that compression molding would not be feasible because of the long flow needed for the plastic material to fill out completely the mounting bosses as well as the thin sections of the barriers.

Unique mold design

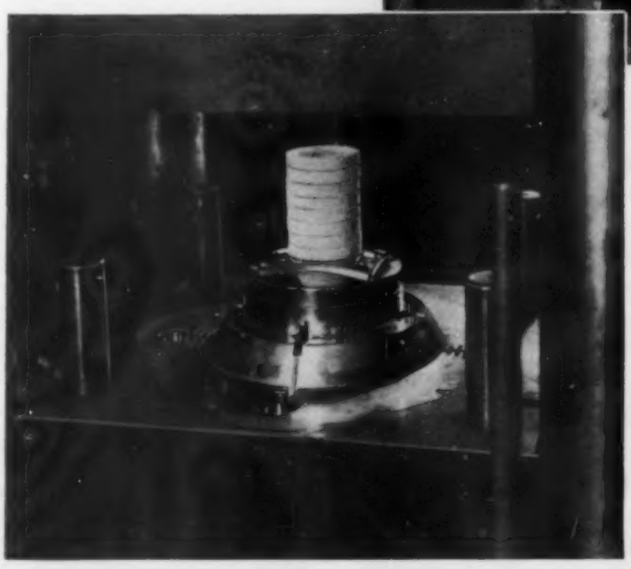
However, because this support was designed with a 3 by 4-in. opening in the top, it was possible to work out a unique mold design and method of molding. The cavity of the mold is mounted on the head of the press and the force plug on the lower or moving portion. A round flat-surfaced plug is inserted in the center of that portion of the force plug which molds the rectangular opening in the part. This



3 — Force plug of mold mounted in lower half of press. Four runners are machined in top of force plug

4 — Looking upward into the cavity of the mold, a portion of the round material chamber is visible

5 — Eight melamine preforms at a time are preheated by high frequency and then stacked on the force plug. The moving plunger in the cavity is raised and mold closed



PHOTOS COURTESY MACK MOLDING CO., INC.

round plug has two grooves in the form of a cross milled in its top surface (Fig. 3). These four grooves continue across the top surface of the raised rectangular part of the force plug, terminating in four thin gates at its outside edges.

Another round plug the same diameter as the round plug in the force plug was ground to size so that it is a perfect slip fit in a matching center hole in the cavity (Fig. 4). This movable mold plug is connected to the ram of an overhead hydraulic cylinder.

With this setup the actual molding operation does not follow the principles of any of the accepted com-

PHOTOS COURTESY MACK MOLDING CO., INC.

6 — As operator prepares to remove molded piece from force plug, it can be seen that there is no separate cull or runners

7 — Immediately upon removal from mold, hot molded pieces are placed on shrink fixtures to cool to exact dimensions

pression methods. For want of a better name, it might be called integral plunger molding inasmuch as a moving part of the mold furnishes the pressure for "filling out" the molded piece after the mold has been closed.

Preforms are preheated

In operation, eight round preforms, slightly smaller in diameter than the moving plug, are preheated for 30 sec. in a Thermall high frequency oscillator. With the mold open, the eight preforms are stacked in the center of the force plug (Fig. 5). The moving plunger in the cavity is raised and the mold is closed. The action of closing the mold pushes the preforms up into the round hole in the cavity. When the mold has been closed and clamped, hydraulic pressure is exerted on the over-head ram which in turn forces the material into all sections of the mold.

The mounting or lower ram of this press is 10 in. in diameter and, with a 5000 lb. line pressure, produces a clamping pressure of 400,000 pounds. The auxiliary over-head ram is 5 in. in diameter. This 5-in. ram is coupled to a 2⅞-in. diameter plunger. When 5000 p.s.i. is impressed on the over-head ram, the molding material receives a pressure of 15,000 p. s. i. In other words, the smaller the diameter of plunger as compared with the over-head ram, the higher will be the molding pressure exerted on the material.

The plunger is heated independently from the rest of the mold by Chromalox cartridge type heaters and is automatically held at 325° F. The cavity and force plug are heated by steam platens and held at the same temperature. All press movements are controlled automatically with the exception of the actual beginning of each cycle. After the mold is clamped and the cavity filled out, high pressure is held on the auxiliary ram for an additional 30 seconds. The high is then shut off and the material is allowed to finish its cure of slightly less than 2 min. under these conditions.

Fin knocked out by hand

The mold is then opened and the finished part removed. As can be seen in Fig. 6 there is no cull in the true sense of the word. There is only a rectangular fin remaining in the center of the piece, which includes the cross shaped, comparatively heavy sectioned material feeder bars. This fin is knocked out of the piece by hand after which the piece is placed on a shrink fixture to cool. This latter operation is shown in Fig. 7.

The slight fin remaining at the parting line in the rectangular center hole is removed by hand filing. The only additional finishing operation required is drilling and tapping of four side mounting holes. The parts are then packed and shipped to the customer where they are sprayed with the high dielectric coating previously mentioned.

TENITE rollers in an aluminum or magnesium frame make a sturdy, portable conveyor which is useful for interdepartmental handling of cartons, or for loading or unloading trucks. The rollers are ten-inch lengths of extruded Tenite tubing two inches in diameter, with injection-molded Tenite roll heads cemented at each end. Bearings are press-fitted into the roll heads, and axles running through the centers fasten rollers to frame.

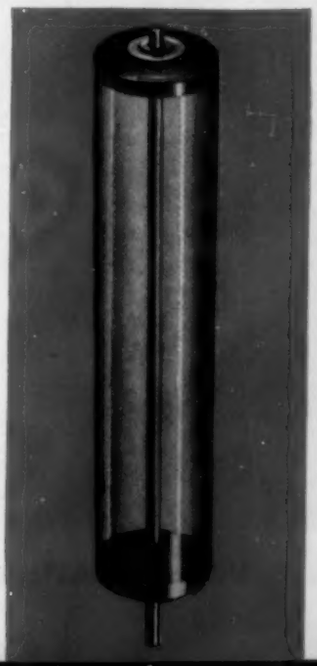
Tenite withstands outdoor exposure and is corrosionproof. It is high in impact strength and resilience, and can't shatter or chip. The lightweight plastic tubes revolve easily and quickly, and have a distribution load capacity of five hundred pounds per ten-foot conveyor section.

Other products in which the lightness and durability of Tenite play important roles are electric-fan housings, earphone headsets, golf-bag bottoms, tool handles, and countless toys destined for rough, hard use. For further information about properties and uses of Tenite, write TENNESSEE EASTMAN CORPORATION (Subsidiary of Eastman Kodak Company), KINGSPORT, TENNESSEE.

TENITE *an Eastman Plastic*

Information regarding Tenite is obtainable through representatives located in Chicago, Cleveland, Dayton, Detroit, Leominster (Mass.), Los Angeles, New York, Portland (Ore.), Rochester (N. Y.), St. Louis, San Francisco, and Seattle; and elsewhere throughout the world from Eastman Kodak Company affiliates and distributors.

Alvey-St. Louis Conveyor made by Alvey Conveyor Manufacturing Co., St. Louis; Tenite tubing extruded by Presstite Engineering Co., St. Louis; roll heads molded by St. Louis Plastic Moulding Co., St. Louis.



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Agricultural Residues in Plastics

III. Evaluation of Residue Flours as Fillers in Thermosetting Phenolics

by T. F. CLARK*

Flours from 22 agricultural residues, including nut shells and fruit pits, were investigated as fillers in thermosetting phenolic molding compounds having resin-flour ratios of 50:50 and 40:60. The resin was commercial powdered two-stage phenolic. Compounds prepared with commercial woodflour and commercial compounds were included for comparison. Compounds were evaluated for flexural and tensile strength, hardness, specific gravity, resistance to impact, absorption of cold and boiling water, and cracking after immersion in boiling water. Virtually all the residue flours could be compounded to products having characteristics meeting A.S.T.M. requirements for general-purpose phenolic molding compounds.

AGRICULTURAL residues such as corncobs, straws, and nut shells are being used commercially in increasing amounts because of specific chemical and physical characteristics and certain economic factors. Grinding is essential in the preparation of the residues for most of their commercial applications. Fine flours as byproducts or coproducts result from all-grinding operations. Already flours from residues such as English and black walnut shells, pecan shells, and corncobs are available in commercial quantities. This paper reports the investigation and evaluation of 22 residue flours as fillers in thermosetting phenolic molding compounds.

Residue flours

The flours used in this study were obtained by separating the products of attrition-mill grinding in a sifter fitted with a 105-mesh screen (openings 0.0065 in.). Three residue flours, from the shells of coconut, English walnut, and pecan, were obtained from commercial sources and were classified as 100 mesh U. S. Standard. A commercial grade of woodflour, Eastern white pine, also 100 mesh, was included for comparative purposes.

Phenolic resin

The resin used throughout this study was a commercial powdered two-stage phenol-formaldehyde resin containing 9% of hexamethylenetetramine. Although the investigation was limited to this one resin, other commercial phenolic resins are known to behave equally well with many of the residues under consideration.

Molding compounds

Compounds were prepared to contain resin and flour in proportions of 50:50 and in some cases 40:60 as shown by the following formulations:

Ingredient	*50:50*	*40:60*
Flour	49.5	59.4
Resin	49.5	39.6
Calcium hydroxide	0.5	0.5
Zinc stearate	0.5	0.5

Water to the extent of 20% of the solids was added to facilitate handling of the mixtures. Mixing, milling, and grinding were done with conventional equipment. Differential rolls were heated to 180° F., slow, and 240° F., fast. Granulated compounds passed a No. 16 U.S. Standard sieve.

Three commercial general-purpose compounds of flow 70, 100, and 120 were included for comparative purposes.

Molding and testing

All moldings were made from electronically-heated preforms. Specimens for flexural, impact, tensile, and water absorption tests were prepared

*Chemical engineer, Northern Regional Research Laboratory, one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture, in Peoria, Ill.

Table I.—Physical Properties of Specimens Molded from Experimental and Commercial Thermosetting Compounds

Type of compound[a]	Flexural strength		Resistance to Izod impact		Tensile strength		Water absorption on 24-hr. immersion		Specific gravity[b]	Rockwell hardness, M scale
	Molded at: 1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.		
	p.s.i.	p.s.i.	ft.-lb./in. of notch	ft.-lb./in. of notch	p.s.i.	p.s.i.	%	%		
Almond shell, hard										
Minimum	8,110	7,730	0.20	0.23	7,800	4,450	0.41	0.44	1.35	116
Maximum	9,700	9,070	0.41	0.30	8,150	6,250	0.44	0.45	.....	
Average	9,060	8,340	0.28	0.25	7,950	5,750	0.43	0.45		
Almond shell, soft										
Minimum	9,570	9,120	0.21	0.27	8,325	7,800	0.41	0.43	1.32	115-117
Maximum	10,650	10,320	0.41	0.30	8,450	8,760	0.42	0.45		
Average	10,080	9,800	0.25	0.27	8,400	8,175	0.42	0.44		
Apricot pit shell										
Minimum	11,210	9,060	0.20	0.24	8,600	8,100		0.19	1.33	116-117
Maximum	12,000	12,340	0.27	0.30	8,900	10,175		0.21	1.32	
Average	11,610	10,490	0.24	0.27	8,750	9,300		0.20		
Apricot pit shell, 40:60										
Minimum	9,850	.....	0.20	0.23	6,175	8,850		0.32	.....	115-116
Maximum	10,820	.....	0.26	0.47	8,900	9,900		0.35	1.39	
Average	10,330	9,860	0.23	0.35	7,850	9,175		0.34		
Apricot pit shell, brine floated										
Minimum	11,730	9,520	0.28	0.24	7,750	7,800	0.19	0.23	1.33	116-118
Maximum	12,600	13,600	0.30	0.30	7,900	9,650	0.22	0.23	.....	
Average	12,140	11,630	0.28	0.27	7,825	8,700	0.21	0.23		
Coconut shell										
Minimum	11,480	9,670	0.27	0.25	8,250	7,600	0.19	0.19	1.31	117-128
Maximum	12,600	11,950	0.27	0.32	8,275	10,200	0.19	0.19	.....	
Average	12,040	10,870	0.27	0.28	8,250	9,100	0.19	0.19		
Corncob										
Minimum	12,240	9,840	0.25	0.18	8,500	8,675	0.31	0.28	1.36	117-120
Maximum	13,860	12,200	0.30	0.27	9,350	9,850	0.32	0.32	1.34	
Average	13,020	10,580	0.28	0.23	8,850	9,300	0.32	0.31		
Corncob beeswing										
Minimum		7,450				5,600		1.42	.....	113-116
Maximum		8,400				7,400		1.44	1.35	
Average		8,080				6,200		1.43		
Corncob low-density components										
Minimum	9,630	7,190	0.25	0.22		5,825		0.57	.....	115-118
Maximum	10,100	9,990	0.30	0.29		8,200		0.59	.....	
Average	9,870	9,010	0.28	0.24		7,100		0.59		
Corncob low-density components, leached										
Minimum	7,120	7,670	0.20	0.25	6,900	7,450	0.37	0.36	1.33	113-117
Maximum	8,790	9,720	0.32	0.34	8,475	8,750	0.39	0.38	1.34	
Average	8,390	8,400	0.26	0.30	7,325	8,200	0.38	0.37		
Cornstalks										
Minimum	8,620	8,320	0.27	0.26	6,550	8,175	0.32	0.32	.....	117-119
Maximum	9,540	9,070	0.31	0.32	9,075	9,050	0.32	0.33	.....	
Average	8,950	8,600	0.28	0.29	8,550	8,525	0.32	0.32		
Corn stover										
Minimum	8,120		0.22		5,850	5,500	0.62	0.63	.....	116-118
Maximum	9,290		0.30		7,400	7,200	0.63	0.66	.....	
Average	8,820		0.26		6,625	6,500	0.62	0.64		
Filbert shell										
Minimum	9,280	9,000	0.20	0.24	6,875	7,575		0.20	.....	115-118
Maximum	9,660	10,760	0.35	0.48	9,075	9,525		0.21	1.34	
Average	9,450	9,810	0.25	0.33	7,975	8,350		0.21		
Filbert shell, 40:60										
Minimum	10,630		0.21		7,900	8,450		0.30	.....	112-116
Maximum	10,850		0.25		9,125	10,100		0.35	1.36	
Average	10,740		0.23		8,500	9,250		0.33		
Flax shives										
Minimum	9,130	8,030	0.25	0.21	7,725	8,050	0.28	0.27	1.33	116-118
Maximum	10,710	9,000	0.32	0.32	9,450	10,150	0.30	0.29	1.34	
Average	9,880	8,530	0.28	0.27	8,300	9,175	0.29	0.28		
Hemp hurds										
Minimum	8,050	6,810	0.25	0.24		8,075	0.20	0.19	.....	114-118
Maximum	9,700	7,830	0.45	0.40		8,200	0.20	0.20	.....	
Average	9,080	7,490	0.30	0.30		8,150	0.20	0.20		
Peach pit shell										
Minimum	9,710	10,220	0.22	0.24		8,000		0.19	.....	114-118
Maximum	10,160	10,750	0.28	0.27		9,175		0.21	1.34	
Average	9,920	10,480	0.25	0.25		8,450		0.20		

[a]Unless otherwise specified, the resin-flour ratio is 50:50. All moldings were made at 320° F. [b]Upper values for specimens molded at 1200 p.s.i.; lower, 3000 p.s.i. [c]Compound also contained 2% of black dye. [d]Compound contained 1% of sodium chloride, approximately the brine content for compound prepared with brine-floated apricot pit shell.

Table I. (Continued)—Physical Properties of Specimens Molded from Experimental and Commercial Thermosetting Compounds

Type of compound[a]	Flexural strength		Resistance to Izod impact		Tensile strength		Water absorption on 24-hr. immersion		Specific gravity[b]	Rockwell hardness, M scale
	Molded at: 1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.	1200 p.s.i.	3000 p.s.i.		
	p.s.i.	p.s.i.	ft.-lb./in. of notch	ft.-lb./in. of notch	p.s.i.	p.s.i.	%	%		
Peach pit shell, 40:60										
Minimum	9,220		0.19		7,200	8,225		0.30	.....	113-118
Maximum	10,000		0.32		8,500	9,125		0.34	1.37	
Average	9,630		0.23		7,850	8,525		0.32		
Peanut shell										
Minimum	8,070	6,060	0.21	0.20	8,025	7,325	0.29	0.29	1.31	115-120
Maximum	10,130	8,720	0.28	0.28	8,925	9,125	0.30	0.32	1.33	
Average	9,380	7,260	0.25	0.23	8,475	8,200	0.30	0.30		
Pecan shell[c]										
Minimum	9,430	9,540	0.18	0.21		8,100		0.26	.....	107-111
Maximum	10,500	11,100	0.39	0.23		8,200		0.26	1.35	
Average	10,060	10,400	0.26	0.22		8,150		0.26		
Pecan shell, leached										
Minimum	8,700	8,970	0.20	0.20	8,050	8,250	0.19	0.20	1.31	114-115
Maximum	10,790	9,540	0.28	0.27	9,250	9,250	0.19	0.23	1.32	
Average	9,850	9,320	0.23	0.24	8,650	8,500	0.19	0.21		
Pecan shell, leached, 40:60										
Minimum	7,750		0.18		8,475	8,250		0.32	....	112-114
Maximum	8,880		0.25		8,750	8,900		0.33	1.36	
Average	8,310		0.22		8,600	8,600		0.33		
Rice hull										
Minimum	10,450	7,780	0.22	0.20	7,850	6,050	0.19	0.21	1.37	118
Maximum	11,570	9,400	0.27	0.35	8,775	8,900	0.21	0.23	1.35	
Average	11,130	8,980	0.24	0.26	8,250	8,075	0.20	0.22		
Walnut shell, black										
Minimum	10,800	11,660	0.25	0.27	8,350	7,800	0.19	0.20	1.33	116-118
Maximum	14,100	12,670	0.27		11,000	10,350	0.19	0.23	1.33	
Average	12,450	12,030	0.26	0.28	9,750	9,000	0.19	0.22		
Walnut shell, black[d]										
Minimum	9,620	11,170	0.27	0.27		6,850		0.25	.....	
Maximum	10,720	13,050	0.28	0.37		7,900		0.31	1.32	
Average	10,170	12,160	0.27	0.31		7,375		0.27		
Walnut shell, English										
Minimum	11,290	10,350	0.28	0.22	9,425	9,150	0.19	0.18	1.32	116-117
Maximum	11,600	12,310	0.33	0.32	9,825	8,875	0.19	0.20	.....	
Average	11,450	11,330	0.31	0.27	9,600	9,400	0.19	0.19		
Wheat straw										
Minimum	9,580	8,820	0.27	0.25	8,575	8,700	0.32	0.30	1.35	117-128
Maximum	10,440	9,810	0.30	0.30	9,300	10,150	0.33	0.33	1.35	
Average	10,300	9,430	0.28	0.24	8,950	9,725	0.33	0.32		
Cherry pit shell, (preliminary)										
Maximum	9,030	9,610	0.21	0.28	9,540	.....	0.21	.....	1.33	117
Wood, Eastern white pine										
Minimum	9,820	9,300	0.22	0.21	9,775	7,825	0.23	0.22	1.32	117-118
Maximum	10,660	9,390	0.28	0.32	9,825	10,600	0.23	0.23	1.32	
Average	10,130	9,330	0.26	0.29	9,800	9,675	0.23	0.22		
Wood, Eastern white pine, 40:60										
Minimum	7,470	7,360	0.23	0.20	6,450	7,050		0.38	....	117-118
Maximum	8,450	8,060	0.30	0.32	7,350	7,450		0.39	1.35	
Average	8,020	7,700	0.26	0.28	6,800	7,250		0.39		
Commercial, flow 70										
Minimum	5,160	6,900	0.18	0.27		6,800		0.38	.....	115
Maximum	9,490	9,290	0.27	0.30		8,900		0.38	1.42	
Average	7,740	8,130	0.23	0.25		7,625		0.38		
Commercial, flow 100										
Minimum	5,590	5,390	0.17	0.25		7,250		0.39	....	113-115
Maximum	9,180	8,350	0.29	0.37		8,975		0.42	1.43	
Average	7,300	7,230	0.23	0.29		8,100		0.41		
Commercial, flow 120										
Minimum	8,080	7,070	0.24	0.26		7,450		0.41	....	113-114
Maximum	9,260	8,460	0.29	0.35		8,800		0.43	1.44	
Average	8,520	7,770	0.26	0.31		7,925		0.42		
General-purpose: wood-flour phenolic, A.S.T.M. specification D 700-43T, type 2	9,000 minimum		0.24 minimum		7,000 minimum		0.80 maximum		1.45 maximum	.....

Table II—Comparison of Flexural and Impact Strength for Several Compounds of Normal Resin Content Molded at 320 and 350° F.

Type of compound	Specimens molded at 320° F.			Specimens molded at 350° F.		
	Electronic preheat range	Flexural strength	Resistance to Izod impact	Electronic preheat range	Flexural strength	Resistance to Izod impact
	sec.	p.s.i.	ft.-lb./in. of notch	sec.	p.s.i.	ft.-lb./in. of notch
Walnut shell, black			*Molded at 3000 p.s.i. pressure*			
Minimum	45-60	11,660	0.27	90	10,770	0.20
Maximum		13,350	0.29		12,340	0.25
Average		12,290	0.28		11,920	0.22
			Molded at 1200 p.s.i. pressure			
Pecan shell, leached						
Minimum	35-150	8,700	0.20	100-110	9,400	0.14
Maximum		10,790	0.28		10,360	0.22
Average		9,850	0.23		9,900	0.20
Rice hull						
Minimum	30-60	10,450	0.22	60-80	7,680	0.18
Maximum		11,570	0.27		11,330	0.24
Average		11,130	0.24		9,600	0.22
Commercial, flow 100						
Minimum	0-120	5,590	0.17	120-200	8,680	0.27
Maximum		9,180	0.29		10,830	0.40
Average		7,300	0.23		9,850	0.32

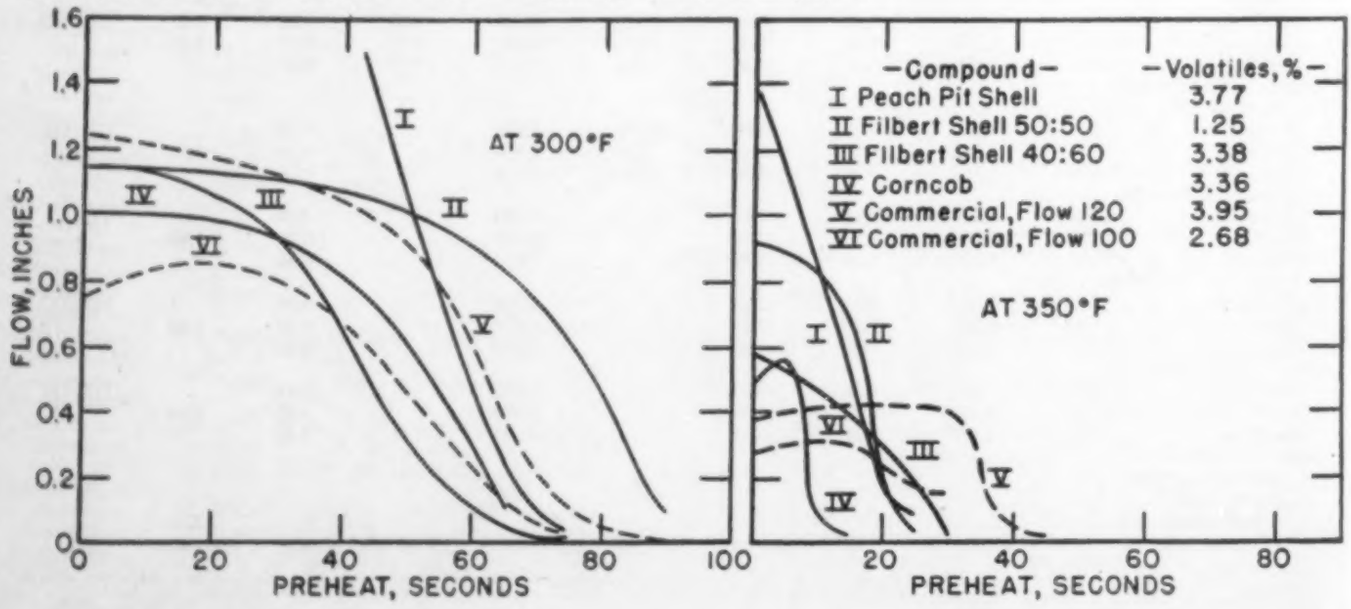
to conform to the dimensional requirements of A.S.T.M. D 647-45T.[1] A flash-type mold was used for flexural and impact specimens. Molds were provided with means for positive ejection of specimens at the end of the molding cycle. Specimens for boiling water tests[2] were 28 mm. short-skirted threaded bottle closures molded in a flash-type mold.

Moldings were made at temperatures of 320 and 350° F. and under pressures of 1200 and 3000 p.s.i. for the following periods:

Flexural and impact bars	7 min.
Tensile specimens	5 min.
Disks, 2 in. diameter by ⅛ in. thick	2½ min.
Bottle closures	30 and 45 sec. and 1, 2, 2½ and 5 min.

(*Please turn to page* 164)

1—Flow characteristics of four residue-filled phenolic molding compounds and two commercial general-purpose compounds at 300 and 350° F. respectively, and 700 p.s.i. pressure



[1] "A.S.T.M. Standards 1945." Part III, pp. 254-6. Philadelphia: American Society for Testing Materials.

[2] "Agricultural Residues in Plastics. Part I. Agricultural Residue Flours," by T. P. Clark, R. V. Williamson, and E. C. Lathrop, MODERN PLASTICS 23, 150 (Oct. 1945).

Table III.—Hot Water Absorption and Resistance to Cracking of 28-mm. Bottle Closures Molded from Experimental and Commercial Thermosetting Compounds

Type of compound[a]	Molding temp.	Electronic preheat	Absorption on 15-min. immersion in boiling water of bottle closures molded as indicated						Resistance to cracking[b]
			30 sec.	45 sec.	1 min.	2 min.	2.5 min.	5 min.	
	°F.	sec.	%	%	%	%	%	%	min.
Almond shell, hard	320	300	3.72	.....	3.06	2.06	[c]	[c]	2
	350	150	1.96	.....	1.81	1.68	1.69	1.61	0.5
Almond shell, soft	320	240	.....	.....	5.08	2.88	2.73	2.27	2
	350	150	1.76	.....	1.74	1.70	1.76	1.76	0.5
Apricot pit shell	320	330	.....	[c]	1.84	1.20	0.89	0.74	2.5
	350	210	0.59	.....	0.57	0.60	0.64	0.68	0.5
Apricot pit shell, 40:60	320	120	.....	2.02	1.89	1.24	1.16	1.10	2
	350	90	1.06	1.00	0.97	0.97	0.96	1.03	0.5
Apricot pit shell, brine-floated	350	210	0.86	.....	0.85	0.85	0.90	0.91	0.5
Coconut shell	320	300	[c]	.....	[c]	1.29	1.21	0.92	5
	350	150	0.73	.....	0.73	0.75	0.77	0.85	0.5
Corncob	320	260	4.13	.....	3.79	2.40	2.25	1.83	5
	350	90	2.23	2.24	1.99	1.88	1.85	1.84	0.5
Corncob beeswing	350	65	2.17	.....	2.31	1.78	2.00	1.71	0.5
Corncob low-density components	350	150	2.19	.....	2.13	2.09	2.04	1.91	0.5
Corncob low-density components, leached	350	90	1.82	1.87	1.68	1.60	1.53	1.61	0.5
Cornstalks	320	150	.....	3.12	2.70	1.90	1.77	1.51	0.75
Corn stover	320	240	.....	[c]	5.18	3.55	3.41	2.31	1
Filbert shell	320	270	.....	2.02	1.55	0.90	0.87	0.70	2
	350	240	1.01	0.80	0.77	0.67	0.65	0.62	0.5
Filbert shell, 40:60	320	120	.....	2.32	1.93	1.42	1.42	1.27	0.75
	350	120	1.23	1.13	1.13	1.06	1.00	1.03	0.5
Flax shive	320	240	.....	3.79	3.53	2.37	1.89	1.39	2.5
	350	90	1.71	1.64	1.51	1.51	1.43	1.37	0.5
Hemp hurd	320	180	.....	3.25	2.70	1.59	1.40	1.13	0.75
	350	90	1.33	1.20	1.25	1.06	1.04	1.12	0.5
Peach pit shell	320	240	.....	2.05	1.92	1.27	1.20	0.77	2
	350	240	1.09	1.12	0.87	0.74	0.70	0.64	0.5
Peach pit shell, 40:60	320	345	.....	4.50	2.84	2.15	1.90	1.15	5+
	320	210	.....	2.61	2.43	1.89	1.54	1.31	5+
	350	210	1.50	1.25	1.25	1.06	1.04	0.96	0.75
Peanut shell	320	180	.....	3.22	3.06	2.05	1.81	1.38	2
	350	90	1.83	1.73	1.73	1.53	1.53	1.45	0.5
Pecan shell[d]	320	300	2.02	.....	1.64	1.63	1.14	0.75	2
	350	60	1.27	.....	0.95	0.70	0.62	0.52	0.5
Pecan shell, leached	320	300	.....	[c]	1.64	1.60	1.34	0.77[e]	5
	350	90	0.84	0.77	0.76	0.70	0.67	0.71	0.5
Pecan shell, leached, 40:60	320	240	.....	[c]	1.89	1.85	1.69	1.46[f]	1
	350	90	1.16	1.15	1.09	1.02	1.04	1.04	0.5
Rice hull	320	250	[c]	2.88	2.89	1.74	1.72	1.25	+5
	350	90	1.56	1.36	1.32	1.15	1.11	1.04	0.5
Walnut shell, black	320	300	[c]	.....	2.10	1.32	1.02	0.76	5
	350	90	0.85	0.68	0.78	0.79	0.81	0.84	0.5
Walnut shell, black[g]	320	180	.....	3.60	3.24	2.03	1.64	1.26	2
	350	90	1.64	1.43	1.32	1.23	1.20	1.14	0.5
Walnut shell, English	320	300	[c]	.....	2.08	1.47	1.19	0.79	5
	350	150	0.61	.....	0.59	0.61	0.63	0.63	0.5
Wheat straw	320	260	.....	3.75	.....	2.44	2.07	1.42	2
	350	90	1.86	1.71	1.73	1.52	1.50	1.49	0.5
Cherry pit shell (preliminary)	350	90	1.37	.....	1.15	1.05	1.04	0.93	2
Wood, Eastern white pine	320	150	.....	[c]	2.38	1.44	1.55	1.12	5+
	350	90	1.23	1.10	1.04	0.96	0.93	0.92	1
Wood, Eastern white pine, 40:60	320	210	.....	[c]	2.81	2.26	2.11	1.48	5+
	350	90	1.65	1.57	1.53	1.41	1.34	1.29	2.5
Commercial, flow 70	320	120	1.58	.....	1.84	0.87	0.71	0.63	0.5
	320	0	.....	[c]	1.37	0.74	0.66	0.59	1
	350	0	0.68	0.61	0.58	0.52	0.51	0.49	0.5
Commercial, flow 100	320	240	.....	[c]	1.51	0.95	0.87	0.66	1
	320	0	.....	[c]	[c]	0.67	0.63	0.56	2
	350	0	.....	0.58	0.54	0.49	0.49	0.43	0.75
	350	150	0.73	0.65	0.59	0.52	0.52	0.46	0.5
Commercial, flow 120	320	0	.....	[c]	[c]	1.17	0.88	0.69	2
	350	0	.....	0.81	0.72	0.60	0.61	0.58	0.75
	350	150	1.57	1.21	0.94	0.67	0.62	0.57	0.5

[a]Unless otherwise specified, the resin-flour ratio is 50:50. All moldings were made at 3000 p.s.i. [b]Molding time required to obtain caps that withstood cracking for 28 days of air-drying following 15 min. immersion in boiling water. [c]Molded closures could not be obtained under the conditions indicated. [d]Compound also contained 2% of a commercial black dye. [e]Preheat period, 240 seconds. [f]Preheat period, 210 seconds. [g]Compound also contained 1% of sodium chloride equivalent to the brine content of the compound prepared with flour from brine-floated apricot pit shells.

PLASTICS DIGEST*

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Testing

HISTORY OF HARDNESS TESTS BASED ON SCRATCH RESISTANCE MEASUREMENTS. E. C. Bernhardt. ASTM Bulletin No. 157, 49-53 (March 1949). The various types of scratch resistance test methods are described; 14 references.

RESINOGRAPHY OF SOME CONSOLIDATED SEPARATE RESINS. T. G. Rochow and F. G. Rowe. Analytical Chem. *21*, 461-6 (Apr. 1949). An unstressed single physical-chemical phase of any resin is characteristically without structure under a light microscope of even the highest resolving power. Generally, only polyphased resin systems manifest light-microscopical structure. Confronted with light-microscopically homogeneous resins, attention was paid to electron microscopical techniques. Replicas of either polished or molded surfaces were more characteristic of the method of preparation than of the specific resin. Therefore, the cold-embrittled resin was fractured under standardized conditions and electron micrographs were taken of replicas of the fracture surfaces. The resins examined were melamine-formaldehyde, polyacrylonitrile, vinyl copolymer, polymethyl methacrylate polystyrene, and polyethylene. All the resins manifested different structures. It is tentatively concluded that these structures are typical and characteristic. Most of the fundamental units are round particles only hundredths of Angstroms in diameter, approaching molecular dimensions. More empirical data are probably needed for a general theoretical explanation but, in the meantime, this resinographic method should be of practical value in the study of both accidental and experimental cracks and breaks among commercial resins and their plastics.

Properties

CONCEPT OF ORGANIC COATING HARDNESS. M. H. Switzer. ASTM Bulletin No. 156, 67-70 (Jan. 1949). Factors involved in the concept of hardness as applied to organic plastic materials are discussed.

POLYETHYLENE PERMEABILITY—II J. H. Parliman. Modern Packaging *22*, 119-22 (March 1949). The permeability of polyethylene film to various chemicals, cosmetics, and household products are reported.

Plasticizers

PLASTICIZERS IN VINYL CHLORIDE-ACETATE RESINS. M. C. Reed and J. Harding. Ind. Eng. Chem. *41*, 675-83 (Apr. 1949). Results of the evaluation of 64 plasticizers, from 23 suppliers, in a vinyl chloride-acetate copolymer resin are tabulated, and test methods are discussed briefly. The data shown in the tables were used as a basis for selecting plasticizers for vinyl resins. The following conclusions relating properties of plasticizers are based on these data: 1) Volatile losses of plasticizers are closely related to their boiling points. A plasticizer should have a boiling point above 200° C. at a pressure of 4 mm. of mercury to have sufficient permanence for most applications. 2) The rate and degree of attack of surface coatings by plasticizers in vinyl sheetings depends, in part, on the chemical structure of the plasticizer. Open chain aliphatic plasticizers are among the most active in attacking finishes. High molecular weight of the plasticizer reduces the rate and degree of marring. 3) There is a correlation between the extractability by mineral oil and the marring activity of a plasticizer. Those plasticizers most easily extracted by mineral oil are generally the most active in marring. 4) The temperature at which a compound has an apparent modulus of elasticity of 10,000 p.s.i. is suggested as a convenient measure of stiffening at low temperatures. 5) High molecular weight polyesters and nitrile rubbers are useful plasticizers for vinyl resins because of the outstanding resistance to volatile loss and extractions, and the low marring action of these plasticizers.

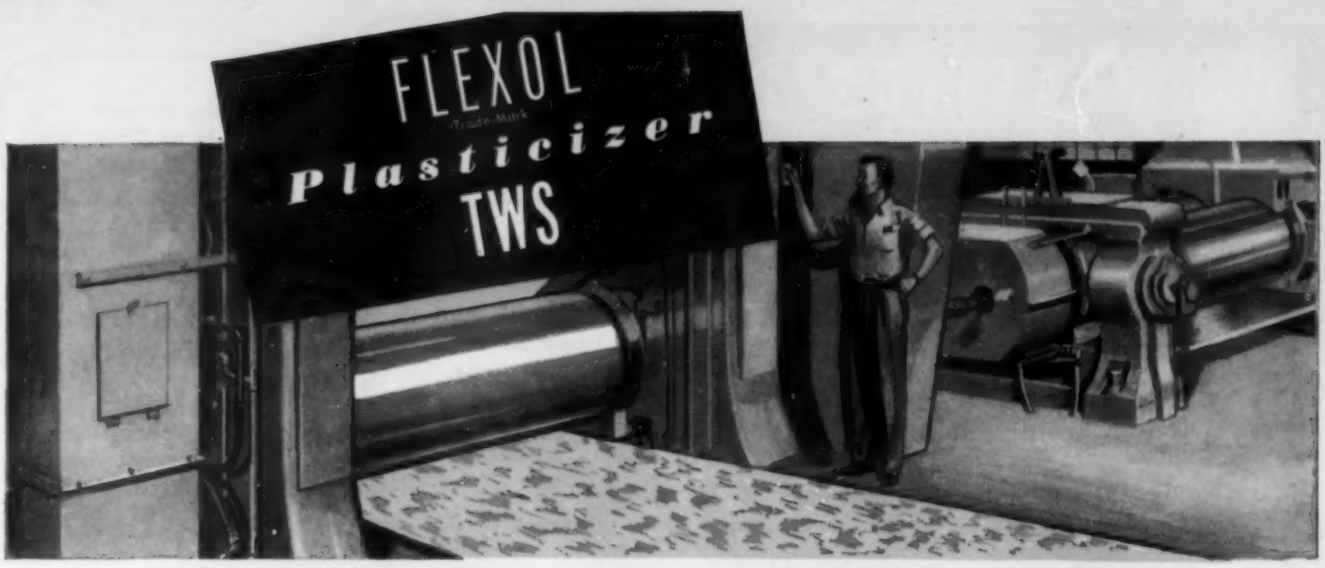
PROPERTIES OF PLASTICIZED POLYVINYL CHLORIDE COMPOSITIONS. D. K. Rider, J. K. Sumner and R. J. Myers. Ind. Eng. Chem. *41*, 709-15 (Apr. 1949). A number of plasticizers were studied over wide ranges of concentration in polyvinyl chloride and in copolymerized vinyl chloride vinyl acetate resin. Properties of the plasticized compositions are plotted as functions of plasticizer concentration. A method of molding test slabs was developed which produced slabs free of shrink marks and other imperfections and with a minimum of residual strain.

Materials

ALKYD RESINS . . . DEVELOPMENT OF AND CONTRIBUTIONS TO POLYMER THEORY. R. H. Kienle. Ind. Eng. Chem. *41*, 726-9 (Apr. 1949). The development of alkyd resins is that of the translation of the chemistry of polyesters to a wide variety of useful industrial products. This development has taken place largely during the last 25 years and has resulted in new and improved coating compositions, adhesives, plastics, and textile fibers. Studies on the polyester reactions and the polymeric products obtained therefrom were among the first to reveal that polyesters result from primary covalent reactions, that the physical properties of polymers are influenced by the constitution and structure of the interacting monomers, and that the type of polymer formed is determined by the functionality of the monomers used in polymer formation. Polyester polymer formation investigations also have provided the basis for the theoretical contributions that have been made to condensation polymer formation and particularly polymers of the cross-tie type; 37 references.

POLYSTYRENES APPRAISED. R. G. Fordyce. Electrical Manufacturing *43*, 84-8, 178, 180, 182, 184, 186, 188, 190, 192, 194 (Apr. 1949). The properties and applications of general-purpose polystyrene, heat-resistant polystyrene, and three copolymers of polystyrene are discussed and compared. All these materials are commercially available; six references.

*Reg. U. S. Patent Office.



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U.S. PLASTICS PATENTS

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BEARING. L. L. Stott (to Polymer Corp.). U. S. 2,459,598, Jan. 18. A bearing of synthetic linear polyamide.

ELASTOMERS. F. J. Groten and R. J. Reid (to Firestone). U. S. 2,459,739, Jan. 18. An elastomer of the butadiene-acrylonitrile type is coagulated from its latex and milled with an uncured phenol-aldehyde resin.

LIGNOCELLULOSE. C. F. Story (to Masonite). U. S. 2,459,851. Jan. 25. Die stock prepared from steam treated exploded lignocellulose fiber by forming thin boards and laminating with heat-convertible resins.

ADHESIVE. G. O. Morrison, T. P. G. Shaw, J. D. P. E. Mercier, and H. M. Collins (to Shawinigan Chemicals). U. S. 2,459,955, Jan. 25. An adhesive comprising a stable emulsion of polyvinyl acetate, gum tragacanth, polyvinyl alcohol, a surface active agent, a plasticizer, and nitrocellulose.

PHOTOPOLYMERIZATION. L. M. Richards (to Du Pont). U. S. 2,460,105, Jan. 25. Photopolymerization of vinylidene compounds in the presence of an organic disulfide.

SEALING MATERIAL. W. P. Marshall (to Pittsburgh Plate Glass). U. S. 2,460,181, Jan. 25. A sealing tape comprising a layer of heat-fusible alkyd resin, zinc chromate, a vinyl resin, and filler.

VINYL POLYMER. G. H. Segall (to Canadian Industries). U. S. 2,460,195, Jan. 25. Polymerization of 4-vinyl cyclohexene dioxide at 0 to 150° C. in the presence of perchloric acid.

MODEL DUPLICATES. H. E. Renaud (to Renaud Plastics). U. S. 2,460,242, Jan. 25. Method of casting molding.

ANACARDIC MATERIALS. M. T. Harvey (to Harvel). U. S. 2,460,255-6, Jan. 25. Allyl ethers of anacardic materials and aldehyde reaction products thereof.

POLYMERS. J. F. Hyde (to Corning Glass). U. S. 2,460,547, Feb. 1. Organo-siloxane polymers.

HEAT-SEALING. N. Langer. U. S. 2,460,460, Feb. 1. A machine for heat-sealing thermoplastic sheet.

MOLDING MACHINE. W. S. Renier (to Giddings and Lewis Machine Tool). U. S. 2,460,468, Feb. 1. Machine for molding plastics and other materials.

PLASTIC MATERIAL. R. W. Chaffee. U. S. 2,460,573, Feb. 1. Mechanism for use in preparing plastic material.

INTERPOLYMERS. V. L. Folt (to Goodrich). U. S. 2,460,573, Feb. 1. Interpolymer of vinylidene halide, a dialkyl ester of maleic acid, and a vinyl halide, prepared by emulsion polymerization.

RESINS. H. L. Allen and E. G. Kerr (to Allied Chemical and Dye). U. S. 2,460,724, Feb. 1. Thermoplastic resins prepared by heating coumarone or indene, a phenol, and formaldehyde in the presence of a mineral acid.

RUBBERY SILOXANE POLYMERS. E. L. Warrick (to Corning Glass). U. S. 2,460,795, Feb. 1. Mixing a liquid siloxane polymer with benzoyl peroxide, heating above 100° C. to gel, milling with filler and benzoyl peroxide.

SILOXANES. A. J. Barry (to Dow). U. S. 2,460,799, Feb. 8. Polysiloxane resins prepared in the presence of aluminum alkoxide.

SILOXANES. E. C. Britton, H. C. White, and C. L. Moyle (to Dow). U. S. 2,460,805, Feb 8. Organosiloxane polymers are condensed to form higher polymers by contacting with acid-activated bleaching earth.

MOLDING. G. J. Kovacs. U. S. 2,460,831, Feb. 8. Continuous injection molding apparatus.

COPOLYMERS. F. G. Pearson (to American Viscose). U. S. 2,460,844, Feb. 8. A copolymer of vinylidene chlorofluoride and acrylonitrile.

MOLDING. F. M. Adair, A. J. Brunner, and B. M. A. Trebes (to Western Electric). U. S. 2,460,964, Feb. 8. Apparatus for molding thermosetting resin.

GRANULATED RESIN. L. Smidth. U. S. 2,461,089, Feb. 8. Continuous process for making improved granular aminoplast resin molding powder.

COPOLYMERS. E. Isaacs and H. Gudgeon (to I. C. I.). U. S. 2,461,383, Feb. 8. Process comprising heating a solution of methyl alpha-acetamino acrylate, acrylonitrile, ammonium persulfate, and sodium sulfite in water.

POLYAMIDES. D. E. Floyd (to General Mills). U. S. 2,461,495, Feb. 8. A resinous polyamide.

ION EXCHANGER. F. K. Daniel (to Sun Chemical). U. S. 2,461,505-6, Feb. 15. Refining biological fluid preparations with a duplex ion exchange resin.

RESIN. M. T. Harvey (to Harvel Research). U. S. 2,461,510, Feb. 15. A thermosetting resin reaction product of furfuraldehyde and a ketone.

FIRE RETARDANT. E. K. Fischer (to Interchemical). U. S. 2,461,538, Feb. 15. A fire-retardant comprising a chlorinated naphthalene or the like and a resin such as a urea or melamine-aldehyde condensate.

ADHESIVES. L. J. Radi (to Interchemical). U. S. 2,461,552, Feb. 15. Adhesives comprising isobutylene-diolefin copolymer or chloroprene polymer and resin from Utah coal.

EXTRUSION. G. Cozzo (to Hydropress). U. S. 2,461,630, Feb. 15. Machine for extruding tubes of plastic material.

ADHESIVE. F. B. Speyer (to Shellmar). U. S. 2,461,704, Feb. 15. Pressure-sensitive greaseproof adhesive comprising polymerized linseed oil, chlorinated rubber, microcrystalline wax, ethyl acetate, and toluene.

COPOLYMERS. C. A. Heiberger (to U. S. Rubber). U. S. 2,461,735, Feb. 15. Process for removing unpolymerized allylic fumarate and allylic alcohol from interpolymers of styrene, allylic fumarate, and allylic alcohol.

CELLULAR RESIN. L. E. Nye (to U. S. Rubber). U. S. 2,461,761, Feb. 15. Rigid cellular material prepared by forming a mixture of a monoenic compound with an unsaturated alkyd resin, a catalyst, a chemical blowing agent, and a metal stearate; whipping the mixture to a froth and heat curing. (*Turn to page* 120)

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EXTRUSION. H. T. Tornberg (to Modern Plastic Machinery). U. S. 2,461,856, Feb. 15. A die mount for plastic extrusion machines.

RESIN. E. R. Dillehay and R. D. Schuetz (to Richardson). U. S. 2,461,882, Feb. 15. Resinous polymerizate of furfuryl alcohol under heat with sulfur catalyst in the presence of water.

REPAIR PUTTY. C. W. Johnson (to Du Pont). U. S. 2,461,900, Feb. 15. Composition prepared by blending an organic plastic binder, a solvent, and cellulosic filler.

SPONGE. W. T. L. ten Broeck, Jr. (to Wingfoot). U. S. 2,461,942, Feb. 15. A light weight elastic sponge comprised of a copolymer of a chlorinated unsaturated dibasic acid and vinyl chloride

FLATTENED TUBING. E. D. Fuller (to Visking). U. S. 2,461,975-6, Feb. 15. Methods for producing flattened plastic tubing.

PROPIOLATE POLYMERS. J. G. Lichty (to Wingfoot). U. S. 2,461,990, Feb. 15. Polymers resulting from the polymerization of beta-cyanoethyl propiolate.

PLASTIC. A. C. Buechele (to General Mills). U. S. 2,462,053, Feb. 22. A plastic comprising a polyamide and a polymerized rosin.

RESIN. J. Delmonte (72% to Ralph Hemphill). U. S. 2,462,054, Feb. 22. A liquid polymer prepared by heating a mixture of resorcinol and furfuryl alcohol in the presence of an alkali catalyst.

RESIN. R. G. Booty (to Weyerhaeuser Timber) U. S. 2,462,252-3, Feb. 22. Condensing phenol and formaldehyde in the presence of an alkali-metal hydroxide, and either polyvinyl alcohol or methyl cellulose, forming a film layer between layers to be bonded and heat curing.

ORGANOSILOXANES. J. F. Hyde (to Corning Glass). U. S. 2,462,267, Feb. 22. A copolymeric organosiloxane comprising units of methyl-trivalent silicon, phenyl ethyl divalent silicon, and phenyl dimethyl monovalent silicon radicals.

POLYETHYLENE. C. S. Myers (to Bakelite). U. S. 2,462,-331, Feb. 22. A polymer of ethylene having incorporated therein a polyhydric alcohol ester whereby it is released from heated rolls.

POLYETHYLENE. J. Harmon (to Du Pont). U. S. 2,462,-390, Feb. 22. Ethylene is emulsion polymerized at superatmospheric pressures with a buffered solution of an alkali persulfate.

COPOLYMERS. F. W. Hoover (to Du Pont). U. S. 2,462,-400, Feb. 22. A copolymer of dihydrodicyclopentadienyl methacrylate and a saturated monohydric alcohol ester of methacrylate acid.

VINYL HALIDES. L. Plambeck, Jr. (to Du Pont). U. S. 2,462,422, Feb. 22. Vinyl halide is polymerized by dispersing in a solution of a salt of perdisulfuric acid and sodium bisulfite and heating.

POLYAMIDES. A. K. Schneider (to Du Pont). U. S. 2,462,430, Feb. 22. Sulfur-containing polyamides prepared by reacting an N-methylol or N-alkoxy methyl polycarbonamide with a thiol in the presence of an acid catalyst.

COPOLYMERS. F. Rosenthal (to R. C. A.). U. S. 2,462,-555, Feb. 22. A copolymer of styrene and 4,4′-divinyl biphenyl.

COUMARONE-INDENE RESINS. S. G. Burroughs (to Penn. Ind. Chemical). U. S. 2,462,608-9, Feb. 22. Coumarone-indene or indene resins are rendered non-yellowing by

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incorporating therewith an alkyl polyhydroxy spiro indane or the sulfonate or borate thereof.

MARKING MACHINE. F. I. Case. U. S. 2,462,628, Feb. 22. Machine for applying flaked markings to a column of plastic material.

SILICON POLYMERS. C. P. Haber (to G. E.). U. S. 2,462,635, Feb. 22. Cyclic polymeric organoaminosilanes.

RESINS. M. T. Harvey (to Harvel). U. S. 2,462,636, Feb. 22. Heat reacting an aldehyde with an organic condensate of a phenol and a phenol ether with a katenoid condensing agent.

RESIN. E. W. Moffett (to Pittsburgh Plate). U. S. 2,462,658, Feb. 22. An amide-aldehyde resin plasticized with a polyester of a dihydric ether of propylene glycol and dicarboxylic acid.

POLYMERS. D. E. Sargent (to Du Pont). U. S. 2,462,680, Feb. 22. Heating ethylene and carbon dioxide at 50 to 300° C. and a pressure of 100 atmospheres or over in the presence of a free radical-producing catalyst.

INDENE RESINS. F. J. Soday (to United Gas). U. S. 2,462,684, Feb. 22. Polymerizing indene or alkyl indenes in the presence of an amine antioxidant.

FIREPROOFING. K. S. Campbell and J. E. Sands (to U. S.). U. S. 2,462,803, Feb. 22. Composition containing chlorinated paraffin wax, a water-soluble urea-aldehyde condensate, and antimony oxide emulsified in water.

COPOLYMERS. L. T. Smith (to U. S.). U. S. 2,462,817, Feb. 22. A copolymer of tetra-allyl pentaerythritol and methyl methacrylate.

ORNAMENTATION. A. A. Flaster, U. S. 2,463,370, Mar. 1. Preheating a plastic surface and impressing a design thereon.

POLYCYCLOPENTADIENE. G. B. Butler (to Rohm and Haas). U. S. 2,463,596, Mar. 8. Preparing polycyclopentadiene in the presence of a haloalkene.

LAMINATES. G. K. Dickerman (to Consolidated Water Power). U. S. 2,463,856, Mar. 8. Paper laminates prepared by calendering sulfite paper, impregnating with alcoholic solution of phenol-formaldehyde resin, and subjecting to heat and pressure.

TRICHLOROSTYRENE. J. C. Michalek (to Mathieson). U. S. 2,463,897, Mar. 8. Polymerized trichlorostyrene.

CONDENSATES. O. K. Johannson (to Corning Glass). U. S. 2,463,974, Mar. 8. Insulating composition consisting of resinous organosilicon compound and ethyl cellulose.

POLYAMIDE-POLYESTER. E. L. Kropa (to American Cyanamid). U. S. 2,463,977, Mar. 8. Heating a reaction mixture of a monoaminomonohydric alcohol, an aliphatic dicarboxylic acid, and a monohydroxymonocarboxylic acid.

FLAMEPROOFING. E. W. Leatherman. U. S. 2,463,983, Mar. 8. A flameproofing composition comprising a chlorinated resinous material, zinc oxide, and gilsonite.

POLYMERS. A. Pechukas (to Pittsburgh Plate). U. S. 2,464,056, Mar. 8. A polymer of a chloroformate prepared in the presence of an organic percarbonate ester.

POLYMERIZATION. F. Strain (to Pittsburgh Plate). U. S. 2,464,062, Mar. 8. A polymer of an unsaturated ester prepared in the presence of an alkyl peroxydicarbonate.

POLYMERS. J. B. Dickey and T. E. Stanin (to Eastman). U. S. 2,464,120, Mar. 8. Polymers of alpha-fluoroacetoxy acrylonitrile. (*Please turn to page* 124)

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SILICONE POLYMERS. J. M. Hersh (to Continental Oil). U. S. 2,464,231, Mar. 15. Method for preparing pentamethylene silicone polymers.

POLYVINYL ESTERS. G. Bowen (to Du Pont). U. S. 2,464,290, Mar. 15. Polyvinyl alcohol prepared by heating a polyvinyl ester in anhydrous alcoholic medium containing an alkali metal alkyl carbonate catalyst.

FIBROUS MATERIAL. F. F. Pollak and J. Fassel. U. S. 2,464,342, Mar. 15. Textiles are rendered nonflammable by impregnating with an aqueous solution of ammonium pyrophosphate and a melamine-formaldehyde condensate.

CONTAINERS. E. Nathan. U. S. 2,464,524, Mar. 15. A container prepared by heat bending hinged thermoplastic sections.

SYNTHETIC POLYCARBONAMIDES. W. Kirk, Jr. and R. S. Schreiber (to Du Pont). U. S. 2,464,693, Mar. 15. A synthetic polycarbonamide.

POLYVINYL COMPOSITION. C. A. Porter (to Resistoflex). U. S. 2,464,717, Mar. 15. Reaction product produced by heating polyvinyl alcohol, furfural, and formaldehyde under pressure.

SHAPING METHOD. C. A. Porter (to Resistoflex). U. S. 2,464,718, Mar. 15. Apparatus for cutting a body of depolymerizable synthetic resin.

POLYMER. D. E. Adelson and H. Dannenberg (to Shell). U. S. 2,464,741, Mar. 15. Polyallyl glycolate.

PELLETS. H. Gering (to Gering Products). U. S. 2,464,746, Mar. 15. Method of manufacturing moldable thermoplastic pellets.

INTERPOLYMERS. F. Grosser (to General Aniline). U. S. 2,464,747, Mar. 15. Heating phosgene with an unsaturated ether.

POLYMERS. E. C. Shokal and L. N. Whitehill (to Shell). U. S. 2,464,753, Mar. 15. Polymerizing a mixed ether of a bis-(hydroxyaryl)alkane such as allylglycidyl diether of bis(4-hydroxyphenyl)-2,2-propane.

COPOLYMERS. R. Rosenthal (to R.C.A.). U. S. 2,465,122, Mar. 22. A resinous copolymer of styrene and 2,5,2′,5′-tetrachloro-4,4′-divinylbiphenyl.

HIGH POLYMERS. J. T. Dickson (to Du Pont). U. S. 2,465,150, Mar. 22. Highly polymeric linear diphenoxy-n-alkane-4,4′-dicarboxylic esters.

TUBULAR ARTICLE. R. J. Nebesar (to Universal Moulded Products). U. S. 2,465,257, Mar. 22. Tubing prepared by laminating flexible sheets.

SILICON COMPOSITIONS. J. Swiss (to Westinghouse). U. S. 2,465,293, Mar. 22. An organo-silicon oxide polymer stabilized with a metal chelate compound.

POLYMERS. R. B. Seymour (to Monsanto). U. S. 2,465,318, Mar. 22. Molded, colorless, thermoplastic resin comprising heating piperylene or a methyl homologue with a nitrile.

POLYMERS. J. R. Whinfield and J. T. Dickson (to Du Pont). U. S. 2,465,319, Mar. 22. A series of highly polymeric linear terephthalic esters.

PLASTIC FORMING APPARATUS. E. A. Hawk, U. S. 2,465,450, Mar. 29. Apparatus for forming articles of plastic material.

ETHYL CELLULOSE. W. D. Paist (to Celanese). U. S. 2,465,472, Mar. 29. A color stable molding composition of ethyl cellulose, dibutyl phthalate, refined mineral oil, and citric acid. (*Please turn to page* 128)

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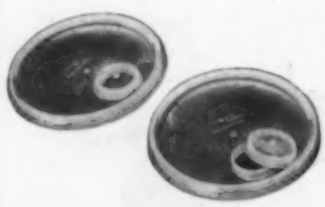

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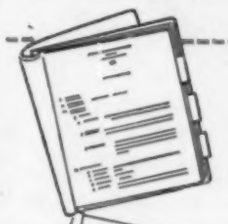
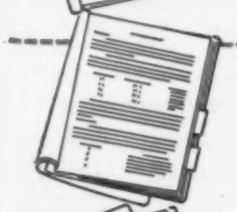


PRODUCT DATA—Section one of this book contains a listing of the complete *Ferro* line of stabilizers. The chemical nature of each is explained, plus all physical properties. Each stabilizer is identified completely by product, number and type for quick, easy reference.



TEST METHODS—A complete description of test procedures in general use, along with a detailed preparation of test samples, will be found in this section for calendered stocks and plastisols.

FERRO INDIVIDUAL PERFORMANCE DATA—Each *Ferro Stabilizer* has been separately tested and is identified as to its heat and light stabilization ratings. Calendered resin and plastisol stability test data is included.

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FURFURYL ALCOHOL. J. J. Clancy (to A. D. Little). U. S. 2,465,710, Mar. 29. A thermosetting hot-moldable furan derivative prepared by condensing and polymerizing furfuryl alcohol with an acidic catalyst in the presence of polyvinyl butyral and compounding with sulfur, zinc oxide, and carbon black.

ALLYL CHLOROSILICANES. E. L. Kropa (to American Cyanamid). U. S. 2,465,731, Mar. 29. Allyl chlorosilicanes prepared by heating silicon tetrachloride with allyl magnesium bromide in the presence of ether.

INJECTION MOLDING. N. Lester and W. H. Schwartz (to Lester Engineering). U. S. 2,465,889, Mar. 29. Injection molding apparatus for molding plastic materials.

CELLULOSE DERIVATIVES. W. J. Myles and J. H. Prichard (to Celanese). U. S. 2,465,914-5, Mar. 29. A color stable composition comprising a cellulose ester or ether containing a polyhydroxy alcohol ester of sulfurous acid.

POLYETHYLENE. E. L. Midwinter and R. B. Richards (to I.C.I.). U. S. 2,466,038, Apr. 5. Polyethylene compositions containing finely divided calcium carbonate.

MOLDING. S. Myerson. U. S. 2,466,040, Apr. 5. A molding composition for use in making a denture base.

VINYL COMPOUNDS. J. D. Danforth (to Universal Oil). U. S. 2,466,212, Apr. 5. Emulsion polymerization of vinyl compounds in the presence of a partial ester of a fatty acid and a poly-oxyalkylene derivative.

COPOLYMERS. J. B. Dickey (to Eastman). U. S. 2,466,-395, Apr. 5. Polymerization of a mixture of methylene malononitrile and vinyl acetate.

THERMOSETTING COMPOSITION. R. D. Dunlop (to Monsanto). U. S. 2,466,399, Apr. 5. A thermosetting composition of polyvinyl butyral, an oil-soluble p-butyl phenol-formaldehyde condensate, and a thermosetting ethyl ether of methylol melamine.

POLYVINYL CARBAMATES. W. F. Fowler, Jr. and W. O. Kenyon (to Eastman). U. S. 2,466,404, Apr. 5. A polyvinyl ester of N-monoethylcarbamic acid.

TOY MOLDING SET. R. Friestedt and R. C. Halfer (to Halfer Engineering). U. S. 2,466,407, Apr. 5. A toy plastic molding set.

SHRINKAGE CONTROL. J. E. Lynn and L. A. Fluck, Jr. (to American Cyanamid). U. S. 2,466,457, Apr. 5. Shrinkage of textiles is controlled by impregnating with aqueous dispersion of methylol melamine and a formaldehyde binding agent such as urea; and heating to cure the resin.

HEAT SEALING. S. H. Magid. U. S. 2,466,643, Apr. 5. Apparatus for heat-sealing thermoplastic strips about elastic elements.

ION EXCHANGE. W. C. Bauman (to Dow). U. S. 2,466,-675, Apr. 12. Method for conditioning a sulfonated ion exchange resin without shattering.

DENTURE. H. D. Morgan. U. S. 2,466,727, Apr. 12. A composite molded plastic denture.

CATALYSTS. M. J. Scott (to Monsanto). U. S. 2,466,744, Apr. 12. A composition of acid-curing aminoplast containing as catalyst a salt of 2-aminobutanol.

PLASTIC FROM STILLAGE. D. A. Legg and M. M. Rayman (to Publicker Industries). U. S. 2,466,774, Apr. 12. Plastic substances prepared by mixing a dicarboxylic acid with a concentrated stillage from a glycerine-producing fermentation and heating.

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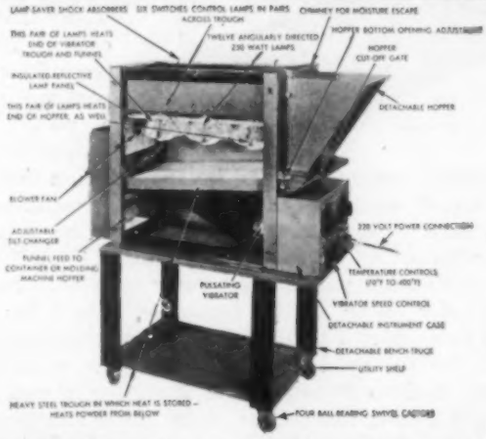
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NEW MACHINERY AND EQUIPMENT

Hopper-dryer—For continuous drying and preheating of thermoplastics for injection molding and extrusion, D & W Products, Inc., 131 Arthur St., Sandusky, Ohio, announces the D & W hopper-dryer. It eliminates the necessity of oven drying in pans and reduces handling costs as material is put directly into the hopper as received. The unit delivers 45 cu. ft. of air per min. under 3-lb. pressure. Thermostatic controls permit adjustment of temperature from 150 to 190° F. The portable blower unit is connected to a hopper extension by a 3-in. flexible hose. This extension doubles the capacity of the existing hopper and, by means of a torpedo, introduces the hot dry air at the bottom of the existing hopper. To remove dust, the air which feeds the blower is drawn through a thick Fiberglas filter.

Performance has been proved by the company in nine months of testing. Without the hopper-dryer, an 8¾-oz. polystyrene shot could not be molded satisfactorily on an 8 oz. injection machine. When the machine was installed, the 8¾-oz. shot was run on a 36-sec. cycle for 60 days of uninterrupted production. In the molding of polystyrene wall tile, the hopper-dryer was found to eliminate the gas marks from the surface of the tile. In another test, it was found that over 70 lb. of crystal butyrate could be dried per hour.

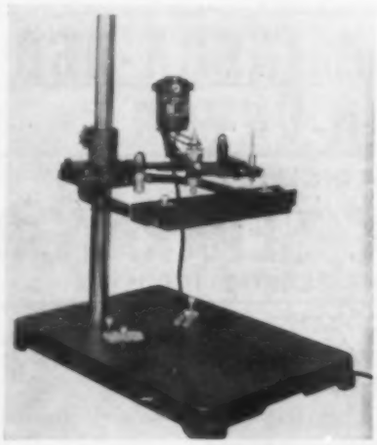
Standard hopper-dryers are for use on 8-oz. Reed-Prentice machines. Other sizes are also available. Specifications include: blower cabinet, 20 by 16 by 16 in.; motor, ⅓ hp. 115 volt single phase 1725 r.p.m.; air hose, 6 ft. long; filter, 12 by 12 by 2 inches.

Slitting machine and winding drum—Columbia Slitting Machine Corp., 1411 S. Michigan Ave., Chicago 5, Ill., is offering the Hirsch slitting machine and Hirsch winding drum. The slitting machine will slit rolls of vinyl and polyethylene film, cellophane, etc., up to 72 in. in width, with individual slitting of rolls from ⅝ in. up to the full width of the fabric. A variable speed motor with multiple clutches on feed and tension roller bars drives the slitter. Units are supplied with 40 slitter knives; additional knives are available. Individual rolls of binding are staggered and wound on individual cores with any inequality in the gage of the film automatically compensated for. There are said to be no burrs on the edges of the rolls, no fusing, and no possibility of the rolls telescoping. Over 100 yd. of material can be slit and wound per min., according to the company.

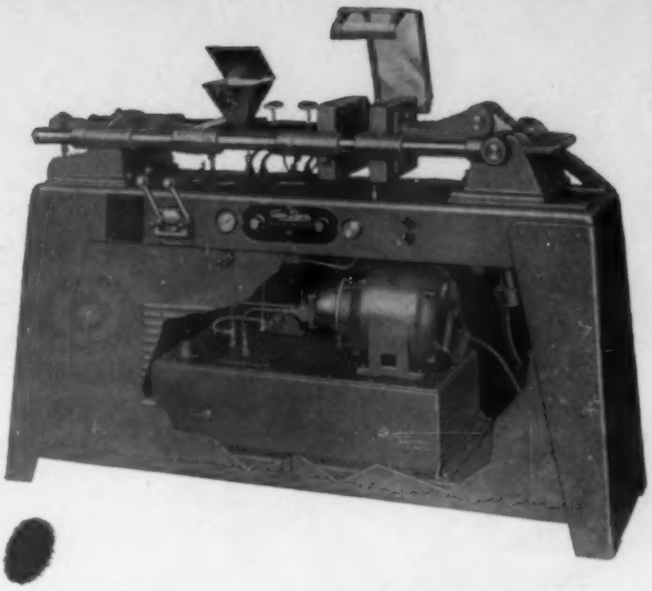
The winding drum can take materials to 54 in. or to 75 in. in width and is adjustable to roll film from 16 to 120 in. in length. Models are also available which will take film rolled to 170 on 226 in. in length. With this drum, one operator is said to be able to handle as much material as four men laying fabric by hand on two 45-ft. cutting tables. Motor driven feed rollers and clutches on the feed rollers insure winding without tension. The drum is equipped with four slitting knives for slitting fabrics while being rolled.

Single or double center winder drive—A mechanical-hydraulic unit, the Greystone drive, which will wind or unroll a web at any predetermined tension from the maximum capacity of the unit down to zero is offered by Frank W. Egan & Co., 108 Hamilton St., Bound Brook, N. J. A self-contained unit, except for the power supply, it can be used on a single or double center winder. It consists of a differential gear set and two oil pumps with a common built-in reservoir. The main pump and its control valve determine the amount of tension to be maintained on the web. The secondary pump and its valve serve as the levelling control for the unit which makes it possible to maintain absolute constant tension, a slight decrease in tension from the core to the full roll, or a slight increase from the core to the full roll.

Engraver—Work up to 19 in. in height can be engraved on the Mico Engraver Model 253, an adaption of Model 252, just announced by Mico Instrument Co., 80 Trowbridge St., Cambridge, Mass. A V groove slot, incorporated in the support post, enables the machine to be swung away from the work and reset in the exact location as before. The pantograph unit, with sub-base, can be removed from the support post and used as a portable engraver on pieces too large or too unwieldy to be engraved on the standard base. It consists of four precisely machined arms which have a minimum number of bearing points—an aid in eliminating the effects of backlash. Four reduction ratios with ratio points are clearly marked. They are: 1.5 to 1 for 7¼ by 2¼ in. rectangle; 2 to 1 for 5½ by 2½ in. rectangle; 3 to 1 for 3⅝ by 2 in. rectangles; and 4 to 1 for 2¾ by 1⅛ in. rectangle. The ratio can be changed and accurately set in a matter of seconds by means of a stud. Regardless of the ratio being used, the micrometer depth control has a range of 0.25 inch. The spindle is mounted on pre-loaded ball bearings and equipped with a chuck which holds midget milling cutters, burrs, or mounted points having ⅛-in. diameter shanks. It may be interchanged with spindles designed for special work.

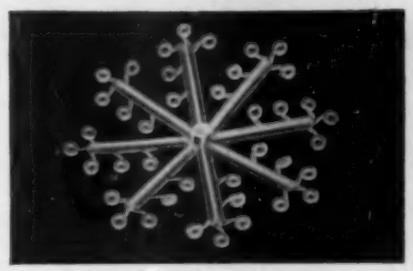


The copy carrier fits the V grooves on the sides of the pantograph and base assembly. It will hold ¾ and 1½ in. master copy blanks.

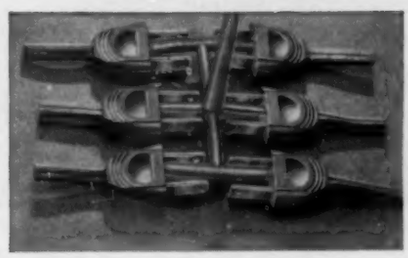


Made at Low Cost ON VAN DORNS

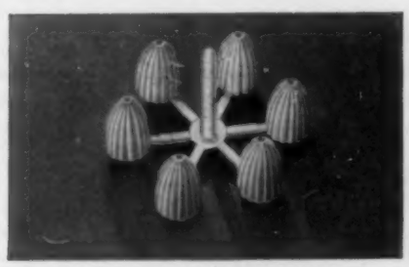
These items are typical of *hundreds* being produced *at lowest possible price* on Van Dorn plastic presses. For these 1 oz. injection presses mold practically all thermoplastics including nylon. Moderately priced, they use inexpensive molds and operate 8 hours for under one dollar. *No wonder these versatile presses quickly repay their cost!*



Polyethylene
¼ ounce
5¼" dia.



Vinyl Chloride
1 ounce
5½" x 3¼"



Polystyrene
4/5 ounce
4" dia.

Extra Savings with NEW GRINDER!

This Van Dorn machine cuts operating costs even more, because it grinds up rejects, sprues, etc., for re-use. Its features include sturdy, all-steel construction, an efficient cutting chamber, and ease of cleaning.

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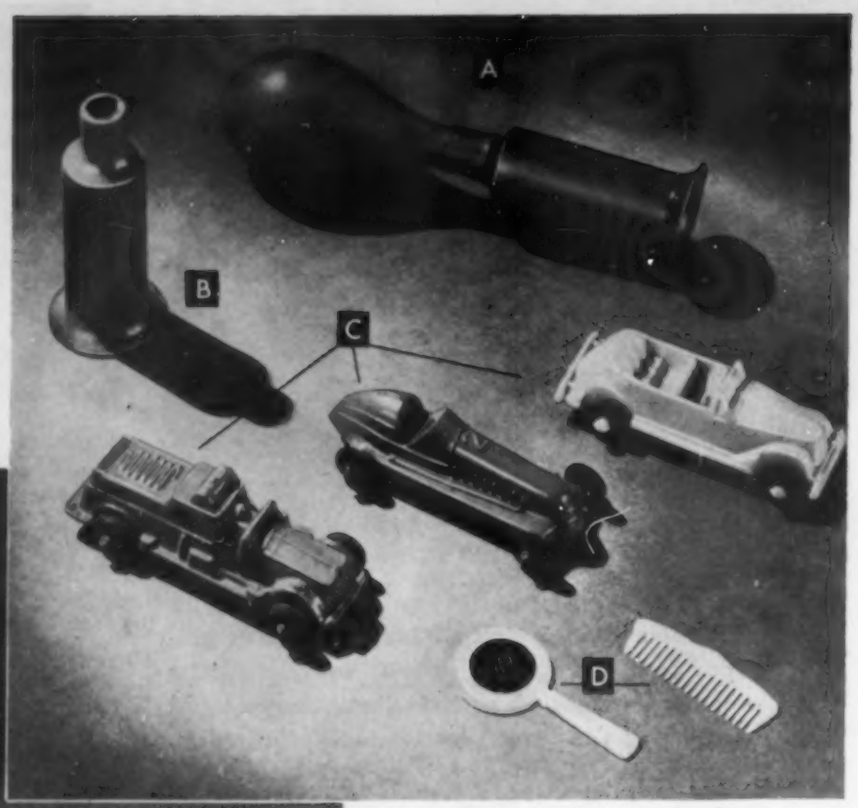
FREE Bulletin
tells all the facts.
Write for it NOW!

THE Van Dorn IRON WORKS CO.
2687 EAST 79th STREET • CLEVELAND 4, OHIO

PLASTICS STOCK MOLDS*

AUGUST 1949



A—Plastic tooter horn. Made of cellulose acetate. Produced in a range of colors including red, blue, green, yellow, and pink. Size, 3 in. long by 1¼ in. in diameter

B—Duck caller. Horn part of caller is made of cellulose acetate and is available in red, pink, green, yellow, and blue. Blower part, which is produced in a variety of colors contrasting with the horn part, is a soft rubber bulb. Size, 5¼ in. long and 1¾ in. wide.

C—Assorted plastic cars, including racing car, touring car, and fire engine, are all made of polystyrene and are available in seven different styles. Racing cars are numbered 1 to 6 on body. Cars come in red, green, yellow, and blue and have moving wheels which are made of rubber. Each car is 3⅛ in. long.

D—Dolly vanity set consists of a miniature comb and mirror which are produced in polystyrene colored pink, blue, green, red, and yellow. Mirror in hand style frame is made of glass. Both mirror and comb are 1½ in. long.

A, B, C, & D are made by Lido Toy Corp., 47 E. 20th St., New York 3, N. Y.

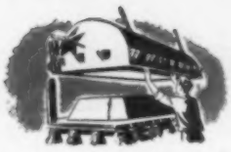
E—Iced tea or liquid refreshment set consisting of tumblers, long spoons and coasters. Come in sets of eight or quantity basis. Made of high heat-resistant Lustrex polystyrene in red, green, blue, and yellow. Tumbler shown holds 14 oz. and is 5½ in. high and 3 in. wide at top. Can also be obtained in four other sizes, 2, 5, and 9 oz., to serve all household uses. Spoons are 8½ in. long. Coasters are 3¼ in. in diameter. Rogers Plastic Corp., North Wilbraham, Mass.

Molders are invited to submit samples of stock products to be described on this page as space permits. Address samples and detailed information to Stock Molds Editor, Modern Plastics, 122 E. 42nd St., New York 17, N. Y.

*Reg. U. S. Patent Office.

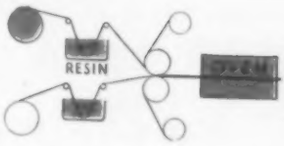
PARAPLEX

"P" SERIES RESINS FOR



MOLDING ?

CASTING ?



LAMINATING ?

ASK what yesterday's molding, casting, and laminating methods could not attempt—

LIST what other plastics (and rubber, wax, asphalt, metals and wood) cannot do—

THEN CHOOSE PARAPLEX, 100-percent reactive materials that can be cured without pressure and at low temperature to tough, durable moldings, castings, and laminates.

That's the way to put PARAPLEXES in their place—right at the beginning of your production plans! These polyesters contain no solvents that must be eliminated prior to use, no extractible plasticizers to worry about. They can be cast and cured to clear, almost water-white solids, or can be pigmented, for they possess excellent pigment wetting and binding properties.

Laminated with paper or fabric, molded with glass fiber or glass cloth, or cast around intricate electrical inserts, the liquid resins can be cured rapidly at low temperature (at room temperature in some applications) to rigid, semi-rigid, or flexible solids with unusual physical and electrical properties.

You will want to know just what the PARAPLEX "P" Series Resins are and what shortcuts to high quality moldings, castings and laminates they provide. First check the properties of the four members of the series. Then write for full details that will help put PARAPLEX in its place in your production.

PARAPLEX P-43: fast-gelling, fast-curing, extremely tough, rigid polyester; now unusually pale and clear. Has good storage life, good catalyzed life, yet is extremely reactive at curing temperatures. Can be cast in large sections which possess excellent electrical properties, which are durable, tough, and resistant to ultraviolet exposure, to acids and alkalies, to organic solvents.

PARAPLEX P-33: a semi-rigid resin, outstanding in toughness and tear resistance.

PARAPLEX P-13: a permanently flexible resin with excellent durability, often used with PARAPLEX P-43 to produce an outstandingly strong material.

PARAPLEX P-10: similar to PARAPLEX P-13, somewhat more flexible, although not compatible with PARAPLEX P-43.

PARAPLEX is a trade-mark, Reg. U. S. Pat. Off.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

The Resinous Products Division was formerly The Resinous Products & Chemical Company

Production of Plastics Materials

FOR the purpose of this report, production is the sum of the quantities of materials produced for consumption in the producing plant, for transfer to other plants of the same company, and for sale. Sales include only the quantities involved in bona fide sales in which title passes to the purchaser.

The figures for sales given in the present report are not comparable with those for consumption in the producing plants plus shipments to other plants given in earlier reports. The figures for production given in the present report, however, would be comparable with figures for consumption in producing plants plus shipments given in earlier reports except for inventory changes. From month to month these changes in inventory may be substantial, but over several months they tend to even out.

PLASTICS AND SYNTHETIC RESIN PRODUCTION IN POUNDS FOR MAR. AND APRIL, 1949
From Statistics Compiled by U. S. Tariff Commission

Materials	*Total prod'n first 4 mos. 1949*	*March 1949*		*April 1949*	
		Production	*Sales*	*Production*	*Sales*
CELLULOSE PLASTICS:[a]					
Cellulose acetate and mixed ester plastics:					
Sheets, continuous:					
Under 0.003 gage	2,618,771	589,660	496,251	508,865	563,679
0.003 gage and over	2,404,166	645,356	643,954	525,492	514,718
All other sheets, rods, and tubes	1,214,945	327,565	289,709	294,530	338,067
Molding and extrusion materials	17,557,205	4,547,696	4,174,449	4,609,974	4,636,633
Nitrocellulose:					
Sheets	2,445,221	622,939	564,904	635,947	549,912
Rods and tubes	534,393	105,495	138,205	113,783	111,518
Other cellulose plastics[b]	3,705,370	1,009,580	1,043,364	1,021,724	663,776
PHENOLIC AND OTHER TAR ACID RESINS:					
Laminating	14,961,511	3,293,187	1,773,337	4,797,190	1,787,085
Adhesives	7,475,654	1,962,474[i]	1,658,906[i]	1,791,434	1,631,984
Molding materials[a]	43,870,139	11,741,123	9,214,785	8,941,553	7,362,111
Protective coatings (containing less than 10% modifier)	5,302,996	1,304,195[i]	709,256[i]	864,727	797,774
Miscellaneous uses, including casting	14,160,459	3,587,754[i]	4,451,448[i]	2,729,844	3,002,626
UREA AND MELAMINE RESINS:					
Adhesives	12,339,036	3,142,655	3,127,220	3,426,485	3,217,932
Textile- and paper-treating resins	9,055,343	2,391,638	1,480,804	1,809,523	1,475,006
Protective coatings, modified and unmodified	5,244,934	1,412,242	997,793	1,066,604	757,887
Miscellaneous uses, including laminating and molding[c]	17,862,231	3,713,552[i]	3,299,809[i]	3,263,684	3,353,731
STYRENE AND STYRENE DERIVATIVE POLYMER AND COPOLYMER RESINS:					
Molding materials[a]	54,663,750	14,984,375	15,439,420	15,830,457	13,580,199
Miscellaneous uses[d]	7,891,695	2,272,936	1,994,296	1,717,388	1,683,787
VINYL RESINS:					
Sheeting and film, including safety-glass sheeting[e]	43,591,545	11,786,984	11,909,960	12,238,957	12,095,921
Adhesives (resin content)	3,297,918	815,018	896,459	1,054,982	818,127
Textile- and paper-treating resins, including spreader and calendering types (resin content)	9,699,806	2,384,398	2,447,442	2,489,723	2,205,475
Molding materials (resin content)	22,489,589	5,660,255	4,856,478	4,426,365	4,434,635
Miscellaneous uses (resin content)[d]	6,575,924	1,572,211	895,588	1,693,765	819,602
MISCELLANEOUS SYNTHETIC PLASTICS AND RESIN MATERIALS:					
Molding materials[a, f]	12,975,643	3,242,825[i]	3,016,229[i]	3,597,437	3,106,375
Protective coatings[g]	14,357,372	3,517,024[i]	3,677,415[i]	3,558,455	3,370,443
All other uses[h]	52,865,205	12,840,845	12,457,064	10,949,500	9,902,760

[a] Includes fillers, plasticizers, and extenders. [b] Includes sheets, rods and tubes, and molding and extrusion materials. [c] Data on resins for laminating and miscellaneous uses are on a dry basis; data on molding materials are on the basis of total weight. [d] Excludes data for protective coatings. These data are included with miscellaneous coatings to avoid disclosure of the operations of individual companies. [e] Statistics include data for virtually all major manufacturers of protective coating resins. The coverage in this report is about 90% complete, based on final returns for the year 1947. [f] Includes data for acrylic, aniline-formaldehyde, polyethylene, nylon and other molding materials. [g] Includes data for coumarone-indene, petroleum polymer and condensation, silicone, and other protective coating resins. [h] Includes data for acrylic, alkyd, coumarone-indene, nylon, petroleum polymer and condensation, silicone and other plastics and resins for miscellaneous uses. [i] The totals given here have been revised from first reports.

Of course he uses the Cambridge Mold Pyrometer. This accurate, quick-acting, rugged instrument instantly indicates the surface temperatures of mold cavities. Its regular use will go a long way in preventing soft centers, off colors, warpage and low tensile strength. Write for descriptive bulletin.

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BOOKS AND BOOKLETS

Write for these publications to the companies listed. Unless otherwise specified, they will be sent gratis to executives who request them on business stationery

"Meet the Plastics," by Clark N. Robinson.

Published by The Macmillan Co., 60 Fifth Ave., New York, N. Y. Price $3.75. 172 pages.

A competent popularized introduction to plastics, covering the various materials, methods of processing, the set-up of the industry, and employment opportunities available. The chapters on processing contain excellent illustrations, but there are some unfortunate omissions in the treatment of materials. Polyethylene and polyester resins are not mentioned at all. The treatment of the chemistry of plastics is somewhat technical and seems out of place in a popular book which also contains some inaccurate statements such as: "Plastic dishes will bounce like ping-pong balls if dropped on the floor." —*W.H.G.*

"Surface Active Agents," by Anthony M. Schwartz and James W. Perry.

Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. Price $10.00. 578 pages.

Three decades of research and development on synthetic surface active agents are reviewed and critically analyzed in this valuable addition to the literature on this subject. The three parts of the book cover the synthesis of the agents, the physical chemistry of their action, and their commercial applications. The authors note that the development of the synthetic surface active agents occurred concurrently with the synthetic plastics; the two materials are also analogous in the number and diversity of industries in which they are used. A 60-page index provides ready access to the abundance of details contained in this book.

"High Molecular Weight Organic Compounds. Frontiers in Chemistry, Vol. VI," edited by R. E. Burk and Oliver Grummitt.

Published by Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. Price $5.50. 330 pages.

This is a continuation of the series based on lectures delivered by invitation at Western Reserve University. This volume includes the following chapters: Polymerization in Suspension and Emulsion, by W. P. Hohenstein and H. Mark; Osmometry and Viscosity of Polymer Solutions, by W. J. Badgley and H. Mark; The Nature of Elastomers, by H. L. Fisher; Aspects of the Structure and Reactions of Proteins, by J. T. Edsall; Condensation Polymerization and Constitution of Condensation Polymers, by P. J. Flory; Physical and Chemical Structure of Phenoplasts, by T. S. Carswell. The reputations of these authors in their respective fields establish the authoritativeness of this review of recent developments in the chemistry of high polymers.

"British Plastics Year Book 1949."

Published by Iliffe & Sons Ltd., Dorset House, Stamford St., London, S. E. 1, England, 1949. Price 30/Net. 511 pages.

Paralleling the ever expanding plastics industry, the 19th edition of this authoritative British annual has been increased in size and has been brought up to date. The nine sections of the book make up a comprehensive buyer's guide to the plastics industry. These sections cover materials used in the plastics industry; manufactured products; plants and equipment; technical and general glossaries; names and addresses; Who's Who in the industry; associations and federations; technical and general data; and an editorial section on patents and British standard specifications.

"Plastics in Engineering," by John Delmonte.

Published by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Price $10.00. 656 pages.

Revised and brought up to date, the third edition of this comprehensive book begins with an introduction to organic plastics and covers such topics as the types of organic plastics; the physical, thermal, electrical, chemical, and optical properties of plastics; design principles; various types of molding; and ends with a discussion of comparative costs of plastics and molds. Numerous illustrations and tables supplement the text.

"Indentation Hardness Testing," by Vincent E. Lysaght.

Published by Reinhold Publishing Corp., 330 W. 42nd St., New York 18, N. Y. Price $5.50. 288 pages.

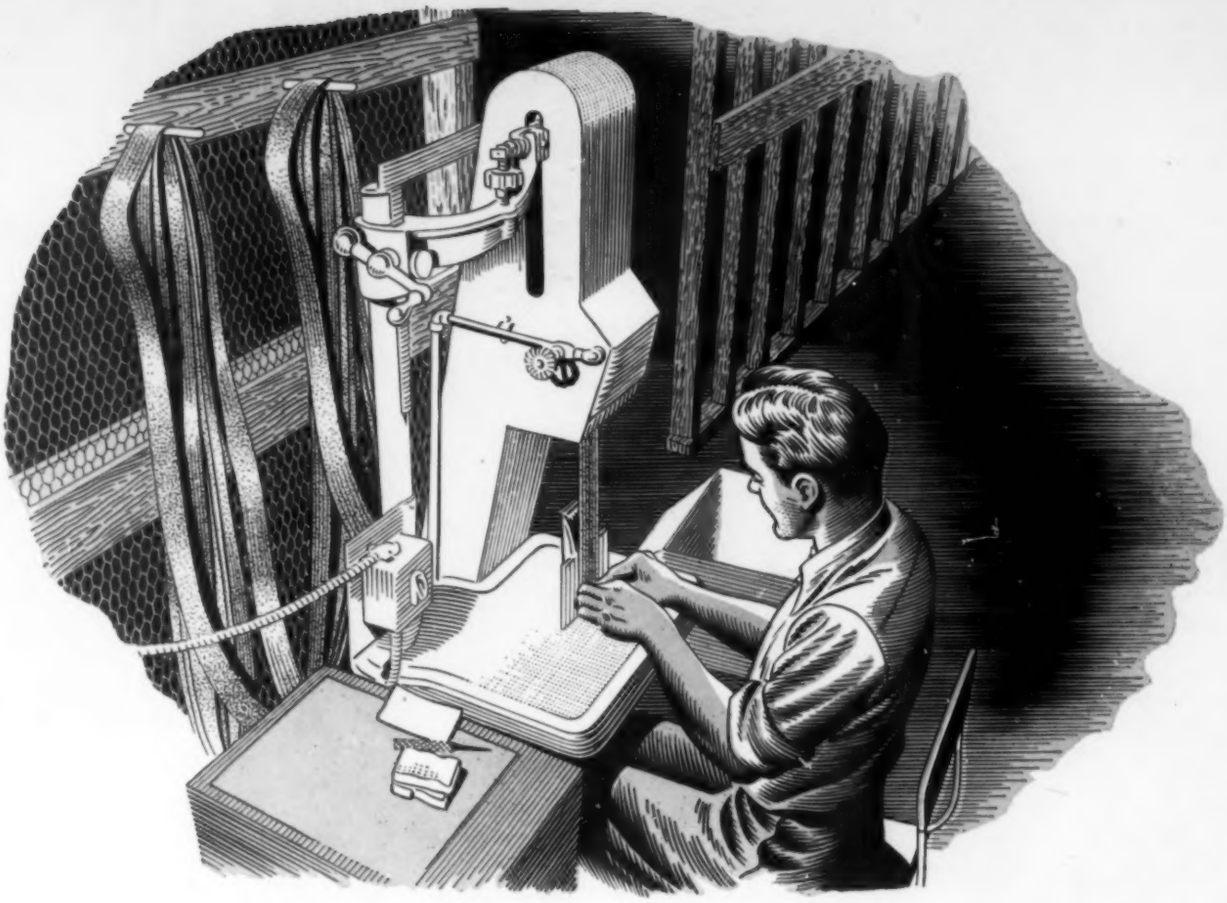
Based upon up-to-date industrial research practice, this book covers the problems involved in the hardness testing of metals and other materials. The text describes the instruments in most common usage, such as the Brinell, the Rockwell, and the Diamond Pyramid. Specialized types of instruments for hardness tests are also described. The advantages and disadvantages for each instrument are evaluated and specifications are presented. Recent advances in the field and the work of hardness committees of the leading technical societies are reported.

The utilization of sugar cane bagasse for paper, board, plastics, and chemicals—This 20-page booklet is a supplement to Scientific Report No. 3, compiled by the Institute of Paper Chemistry. It is not claimed that this supplement is complete. Certain articles may have been overlooked because their titles did not indicate that they were concerned with a bagasse or because the abstract journals did not carry a reference to bagasse. It is believed, however, that all important references are included through December 1948. *Sugar Research Foundation, Inc., 52 Wall St., New York 5, N. Y.*

Flexible metal hose, bellows, expansion joints (Catalog G-50)—Full descriptions and complete specifications for standard types of flexible hose in a variety of metals are contained in this 68-page booklet. Sections on expansion joints for piping systems, stainless steel and brass bellows, and various conduits and special assemblies of these components are also included. *Chicago Metal Hose Corp., Maywood, Ill.*

Hanna low pressure cylinders (Catalog No. 236)—This 20-page booklet on the company's low pressure cylinders includes dimensional drawings, construction features, and information on the capacities of all standard sizes of cylinders. Also presented are data on cylinder se-

(*Please turn to page* 139)



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plastics and metals

AUTO-LITE MEANS PRECISION MANUFACTURING

(*Continued from page* 136)

lection, cylinder cushions, and mounting brackets. *Hanna Engineering Works, 1765 Elston Ave., Chicago 22, Ill.*

Inventors' sales bulletin—A new product service is now being offered manufacturers anxious to get in touch with inventors having patents for sale or for lease on a royalty basis. This service consists of a 32-page brochure which presents a list of 106 firms offering to buy accepted inventions. Manufacturers are invited to list the type of new products for which they are in the market. The bulletin, selling for $1.00 and published at frequent intervals, circulates among inventors. For a free listing, write for an explanation blank explaining how to write-up your requirements. No charge for the announcements of manufacturers. *V. D. Angerman, Publisher, Science and Mechanics, 49 E. Superior St., Chicago 11, Ill.*

Ethyl cellulose, properties and uses—Revised information on this cellulose derivative which can be formulated into plastics, lacquers, varnishes, film and foil, and adhesives is contained in this booklet. Many applications for the material are suggested. The booklet is divided into three sections: Introduction, which includes a description of the material's properties; Formulation, which deals with the solvents, resins, plasticizers, and other ingredient used in ethyl cellulose formulations; and Specific Applications, in which end uses are discussed. *Hercules Powder Co., Inc., Wilmington, Del.*

Perma-Skin vinyl corrosion resistant protective coatings—Contained in this four-page folder are data on a plastic protective coating which is proving successful in combatting corrosion of metal, wood, stone, brick, and concrete structures by atmospheric and chemical action. *The Dennis Chemical Co., 2701 Papin St., St. Louis 3, Mo.*

American standard building code requirements for signs and outdoor display structures—The use in signs of plastics such as acrylic has been approved and the code requirements and limitations are put forth in this brochure. *American Standard Association, Inc., 70 E. 45th St., New York 17, N. Y.*

Baldwin grips, accessories, and auxiliary equipment (Bulletin 261-A)—In the testing of materials, the value of a testing machine is often dependent upon the grips and accessories used with it. This 11-page bulletin illustrates, describes, and gives specifications for such items as specimen holders, grips, compression plates, jigs, and flexure tools. *The Baldwin Locomotive Works, Philadelphia 24, Pa.*

Taber plastic fabricating machines—Eight of the company's fabricating machines are illustrated in this folder. Specifications are given for each machine. *Taber Instrument Corp., 111-MPL Goundry St., North Tonawanda, N. Y.*

The inside story of Allis-Chalmers "Safety-Circle" motor protection (Bulletin 51B6210B)—Described are the design and construction features of the Safety-Circle motor; dimensions and specifications are given. Drip-proof and splash-proof motors are available in sizes from 1 hp. at 1800 r.p.m. to 20 hp. at 3600 r.p.m. *Allis-Chalmers Mfg. Co., 1163 S. 70th St., Milwaukee, Wis.*

Eastman industrial chemicals—The 1949 edition of this annual catalog lists aliphatics, aldehydes, acids, anhydrides, esters, and alcohols, as well as cellulose products and several inorganic chemicals, such as technical manganese sulphate, iron oxide, and zinc thiocyanate. *Tennessee Eastman Corp., Kingsport, Tenn.*

The plastics industry in New England—Presented in this 17-page booklet is the outlook for plastics, the development of the industry, the divisions of the industry, the manufacture of plastic materials, capital requirements for getting into the industry, and the manufacture of plastic products—all from the standpoint of the New England area. Compiled by the Frst National Bank of Boston in cooperation with the Committee on Economic Research of the New England Council. *The First National Bank of Boston, Boston, Mass.*

Tools engineer's handbook—The field of mechanical manufacturing industries and all the processes they employ in fabricating raw materials into finished products are covered in this engineer's handbook. In addition to its primary use by tool or production engineers, the 2300-page handbook will inform non-engineering management on the essentials of manufacturing. Some of the topics in the book include: materials and machinability; metal forming; machine tools controls and feeding devices; design of threads, gears, bearings, and springs; and gaging, inspecting, and testing. For details, write to *American Society of Tool Engineers, 10700 Puritan Ave., 21, Mich.*

Kel-F Bulletins 1-1-49, 2-1-49, & 3-1-149—These three bulletins cover the physical and mechanical properties of Kel-F molding techniques, and specific thermal treatment for varying the physical properties of the molded material. *Chemical Mfg. Div., The M. W. Kellogg Co., P. O. Box 149, Jersey City 3, N. J.*

Higher diols (Form 6719)—Uses and properties of eight new glycols are described in this eight-page booklet. Specific glycols described include butanediol-1,3; pentanediol-2,4; the two six-carbon diols; 2-methyl-pentanediol-2,4; hexanediol-2,5; heptanediol-2,4; ethyl-hexanediol; and two new substituted 1,5-pentanediols. Physical properties for the higher diols are given, comparing them to the lower, more familiar 2- and 3-carbon glycols and glycerol. Uses have been tabulated by product and industry for quick reference. *Carbide and Carbon Chemicals Corp., 30 E. 42nd St., New York 17, N. Y.*

Electronic core baking (Data Sheets No. 1 & 2)—These sheets discuss the fundamentals of electronic core baking, particularly when using synthetic resins as binders. *Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y.*

Plexene TA—This folder illustrates some of the applications for Plexene TA, a new thermoplastic molding powder with impact strength in the high cellulosic range. The properties of the material are listed. *Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa.*

Automatic recessing tools—A clearer picture of the applications, operation, construction, and advantages to be gained by the use of modern automatic recessing tools is offered in this 26-page booklet. The company, pioneer in the development of recessing tools, states that its automatic tools will perform 90% of all recessing operations such as internal grooves, undercuts, and recesses in castings, forgings, or molded parts. *Scully-Jones & Co., 1982 S. Rockwell St., Chicago 8, Ill.*

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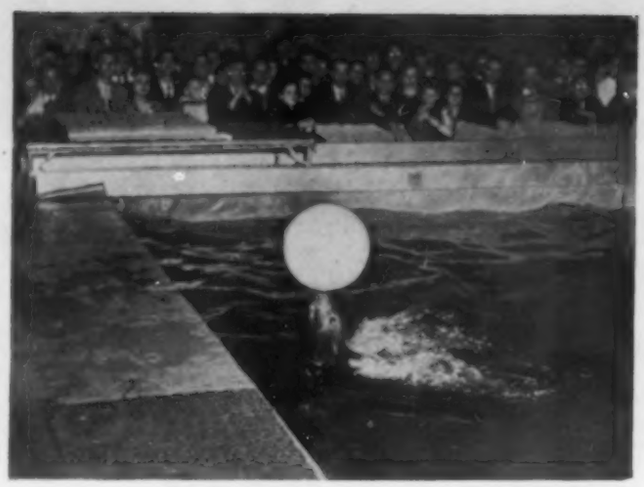

Swimming pool for indoor aquatic shows consists of vinyl coated liner supported by a dismountable aluminum frame

Vinyl Liner

A COTTON fabric with a vinyl resin coating has been used successfully as the liner for an indoor swimming pool measuring 32 by 68 by 4 ft. and capable of holding 32,500 gal. of water. Developed jointly by the Chemical Div., The Glenn L. Martin Co., Baltimore, Md., and the Pantasote Co., Passaic, N. J., this portable pool was first tried out at the League of Maryland Sportsmen Show in Baltimore in 1947. Since that time, it has been set up and dismantled a half dozen times. The flexibility and tensile strength of the coating are said to have been retained.

Weighs 437 pounds

Engineers from both companies began experimenting in 1946 to design a liner which could be fitted over a strong frame and used as an exhibition pool for indoor aquatics. The result is composed of rectangular strips of duck to which has been applied a calendered coating of specially formulated Marvinol resin. These strips were stitched together and water-sealed along the seams with vinyl resin. The total weight of the completed liner is 437 lb. or less than 1/5 lb. per sq. ft. of area. This compares most favorably with an earlier unsuccessful lining of a heavy rubberized material weighing nearly ½ lb. per sq. foot. The liner is supported by a dismountable frame made of aluminum.

It takes 15 men about three working days to set up the pool for water shows. After the frame is erected, the liner is placed in the center of the frame and the sheeting unfolded outward. Close attention is paid to keeping the sheeting smooth and tucked in snugly at the corners. It takes about three hours to fill the pool with a fire hose. A special baffle has been constructed for the hose to protect the liner's seams from the direct force of the water.

Weighing 437 lb., liner is made of rectangular strips of duck stitched together and water-sealed with vinyl resin

for Exhibition Pool

In setting up, liner is spread smooth from center of pool over metal frame. Close attention is given to the corners

Completed pool measures 32 by 68 by 4 ft. and holds 32,500 gal. of water. Using fire hose, it takes 3 hr. to fill

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Rotary Display

A DRAMATIC display unit is being used by the Parker Pen Co., Janesville, Wis., to merchandise its "51" pen and Super-Chrome ink. This eye-catching point-of-sales aid, in which the two displayed items mysteriously rotate on the ends of a crystal-clear curved rod, utilizes Tenite II and Plexiglas parts made by Recto Molded Products, Inc., Cincinnati, Ohio, for Burton-Rodgers, Inc., Cincinnati, designers and producers of displays.

The unit's plastic components consist of a butyrate central housing, the curved acrylic rod to the ends of which are cemented acrylic disks, and disk covers which support the ink bottle and pen.

Rotation of the disk covers, and hence of the displayed items, is achieved through the use of an electric vibration unit mounted in the base. This unit sets up vibrations in the curved acrylic rod, which are transmitted to the disks. Each disk is covered with a mohair pad, the hair of which is laid in the direction of the desired movement. The underside of each disk cover is scored lightly so that a continuous pushing action is obtained, similar to a ratchet and pawl. The only parts visibly moving are the displayed items and the disk covers.

Rotating display has butyrate central housing. Curved rod and platforms for displayed items are made of acrylic

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"I've come to the conclusion that there is no substitute for the happiness and contentment you get in living and working in a place you like. Yes, I'm glad I stayed in Maine.

"Take my work in the woolen mill. I have worked here for fourteen years and have thoroughly enjoyed it. I get real downright pleasure in seeing fine woolen cloth come from the mill and I take a great deal of pride in the part I do.

"I wouldn't trade my life in Maine for all the bright lights of the city. I have a 200 acre farm, keep a small herd of good cows and cut some wood on the side. Take it from me, Maine is a grand place in which to live, work and play."

Truman M Pease

Truman Pease is typical of thousands of Maine workers who take pride in their work and really enjoy life. Maine has what your industry needs. Nearness to the nation's biggest markets; year 'round production weather; moderately priced power; pure processing water; excellent transportation; fair taxes; no State sales tax; no State income tax.

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Ribbon Fan

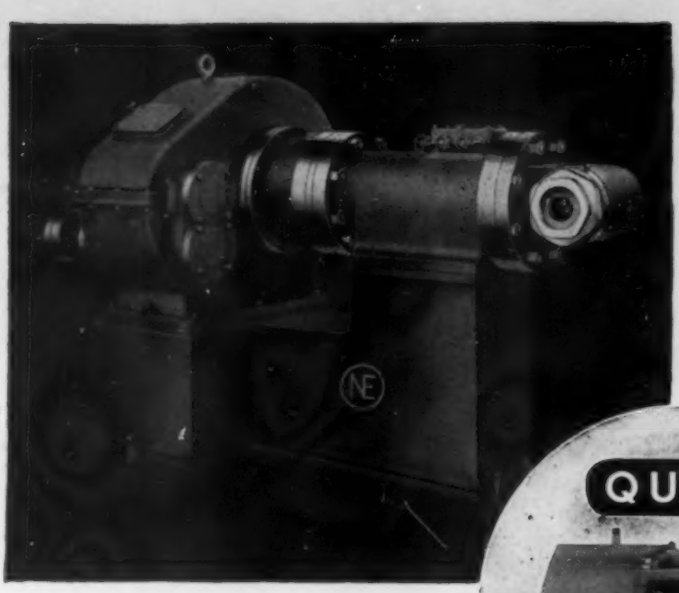
CHILDREN'S inquisitive fingers are protected from injury by the use of ribbon blades in the new Ribbonaire fan, manufactured by the Singer Sewing Machine Co., New York, N. Y. Another unusual feature of this fan is the phenolic housing which is molded in six parts by the Diehl Mfg. Co., Somerville, N. J.

These six parts consist of the shell housing the motor, the bracket or upright, the base, control knob, and two small plugs. All are produced of Bakelite wood-flour filled phenolic in a mahogany color.

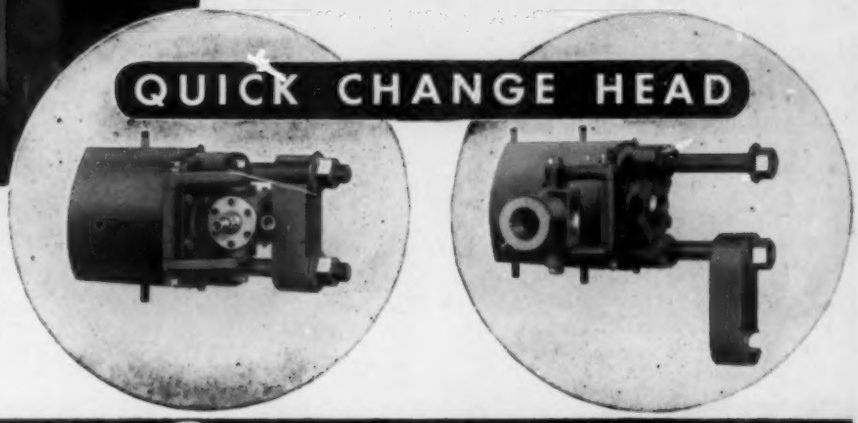
One of the advantages of this fan is its lightweight. Measuring 10¼ in. high and weighing about 4 lb., it can easily be carried from room to room whenever desired. The two-speed switch controls the volume of air delivered and the bracket can be adjusted to direct air flow. Said to be completely shockproof, the fan operates on AC only, at 110-120 volts, 40 watts, 60 cycles.

Three replaceable grosgrain ribbon loops comprise the three blades. These distribute air gently and noiselessly over a wide area, and completely eliminate direct drafts which are produced by fans of conventional design. Because of this, the fan may be used for cooling relief in the summer and for warm air circulation in the winter. Unpleasant cooking and tobacco odors can be cleared from a room by placing a few drops of perfume on the loops.

Phenolic components of fan and assembled unit. Grosgrain ribbon blades are noiseless, cannot harm children's fingers



NE TUBERS *adaptable to* **variety of products. Illustrated at left is a 4½" NE tuber equipped with cross-feed flanged-type head for insulating wire, extruding hose covering, special shapes or tubing. With slight modifications, either rubber or plastics can be handled.**



NE Quick Change Head Unit permits swinging Die Head out, for cleaning, inspection or changing. Just loosen 2 bolts. This feature illustrated on a 3½" NE Tuber is available on all sizes thru 6".

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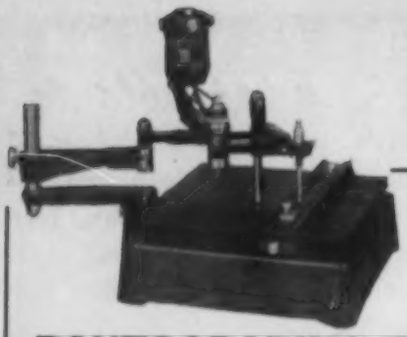

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Flame-resistant acetate is used for side knob and top of handle of buffer-sander machine. Bottom picture clearly shows heavy mounting bosses and thin wall construction

Acetate Sander Handle

REPORTED to be one of the first uses of a thermoplastic material in heavy duty electrical tools, an acetate handle is a feature of a new Craftsman buffer-sander machine. The handle is molded of flame-resistant Hercules cellulose acetate by the American Phenolic Corp., Chicago, Ill., for the American Floor Surfacing Machine Co., New York, N. Y., which manufactures the device for Sears, Roebuck & Co.

The sanding machine employs a plastic top handle that incorporates a ventilating shield for the motor, and a plastic side knob for easy two-handed operation. Heavy bosses, molded in the bottom of the handle, provide for screws which mount the handle on the sander's frame. It will be noted from the bottom illustration (above) that the handle has a relatively thin wall, a design feature permitted by the use of the tough, resilient acetate. The handle and knob are molded in fawn gray.

The buffer-hander, which can be used for buffing, sanding, drilling, polishing, and a variety of other home workshop or factory jobs, has a heavy die-cast aluminum frame, helical spur gears, and operates at 1600 r.p.m. on 110 volt circuits.

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will wind from free loop
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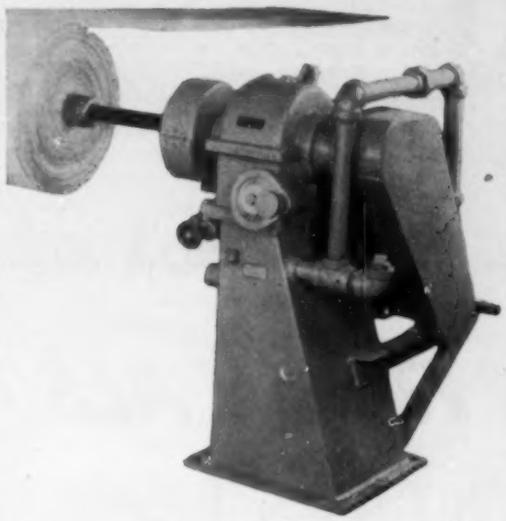

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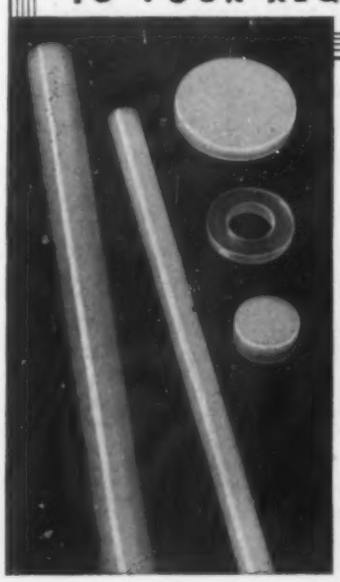

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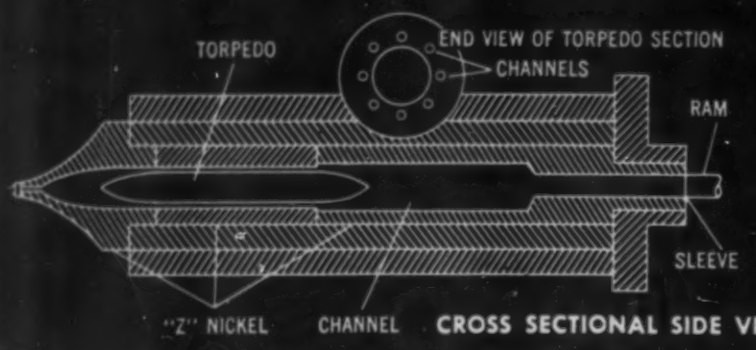

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The one illustrated above was no exception *before* it was redesigned.

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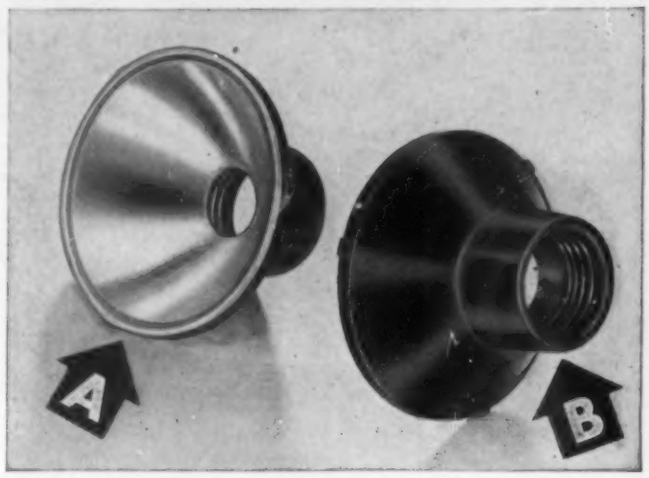
WHAT'S NEW IN AUBURN Plastics

Flashlight reflector produced for National Carbon Company, Inc.



A Perfect Plastics Application: Better Performance – for Less

Two new "Eveready" spotlights now use plastic reflectors produced by Auburn. The molded reflectors, finished with vaporized aluminum, produce a better "spot" than metal reflectors. The projected light spots are brighter, uniformly round, and evenly diffused. The sturdy reflectors resist severe abuse and, being thermo-setting, maintain accuracy of contour under extreme conditions.

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Artificial feeding device utilizes a phenolic check valve consisting of a ring and valve, as shown above. At right, the calf is compelled by the check valve to drink his milk in small sips

Calf Feeder

AN artificial feeding device that enables calves to drink milk from a pail makes use of a phenolic check-valve that compels the animals to take small sips rather than gulps, and thus prevents indigestion. The check-valve is molded by the Plastics Div., General Electric Co., Pittsfield, Mass., for the Calf-teria Co., Fort Wayne, Ind.

The pail, which is known as the Calf-teria, has a protruding rubber nipple near the bottom, from which the calf can take milk under conditions that are said to be similar to natural feeding.

The phenolic pieces consist of the valve, which is transfer molded in a six-cavity die, and a ring, which is compression molded in a four-cavity die. The ring is used to hold the rubber nipple on the valve. After the valve is molded, a glass marble is placed inside of it for one-way flow of milk. The marble is held in place by a pin. Both valve and ring can be removed for cleaning.

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This machine is useful primarily to manufacturers who compound plastic materials. The machine may be used to reduce material for use as a commercial product without further granulating. Or it may be used to prepare material for subsequent final reduction in a granulating machine.

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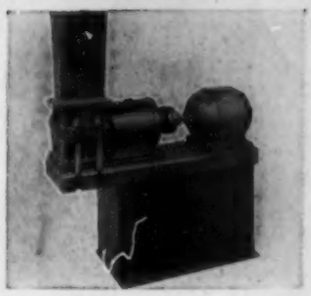

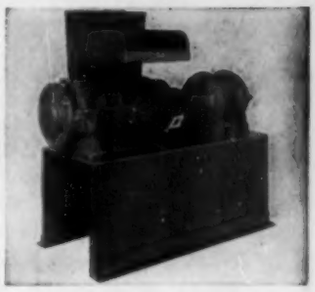

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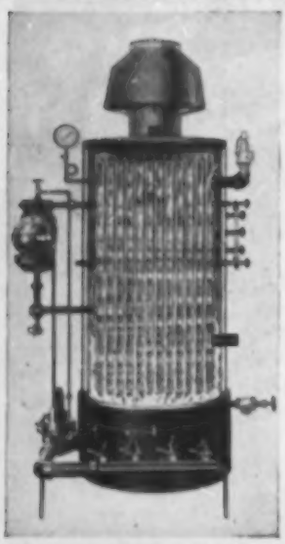

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Dome and base of baby casket-vault are formed of acrylic. The two parts are assembled by means of hinges and locks

Casket-Vault

BABY casket-vaults are being formed of acrylic by Southwestern Plastics, Houston, Texas, for the Houston Casket Co., also of Houston. Known as The Mausus, the caskets are available in lengths of 2, 3, and 4 feet.

Acrylic was chosen as the material for the casket because of its resistance to chemicals naturally present in the soil, its high impact strength, its dimensional stability, its color appeal, and the fact that it is impervious to attack by living organisms.

Two acrylic sheets used for dome and base

The two parts of the casket-vault — dome and base — are formed from single rigid sheets of acrylic, and are assembled with hinges on one side and locks on the other. Since the forming operation produces a seamless unit, and the dome is locked securely to the base when closed, the caskets are reported to be completely air tight. Handles are fused to the sides of the dome. A molded-in cradle holds the body in position.

Body is held in position by a molded-in cradle. When the casket is closed the dome is securely locked to the base

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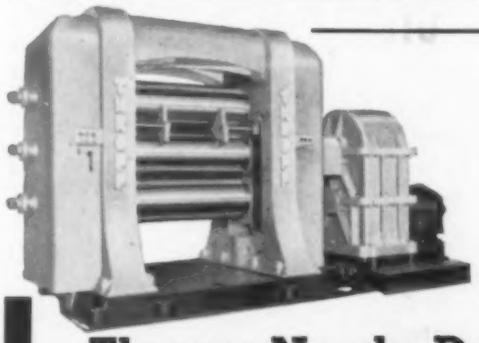

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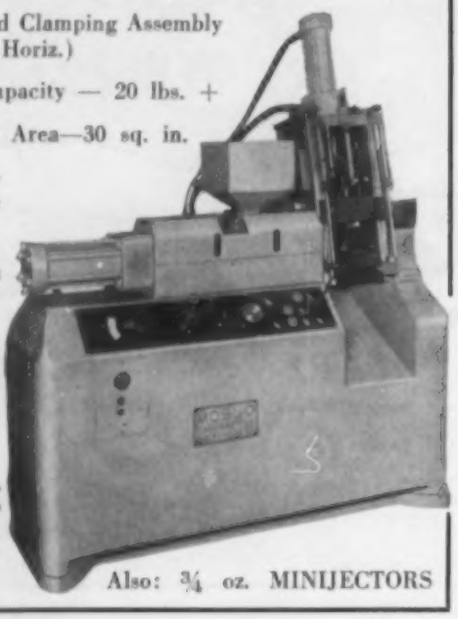

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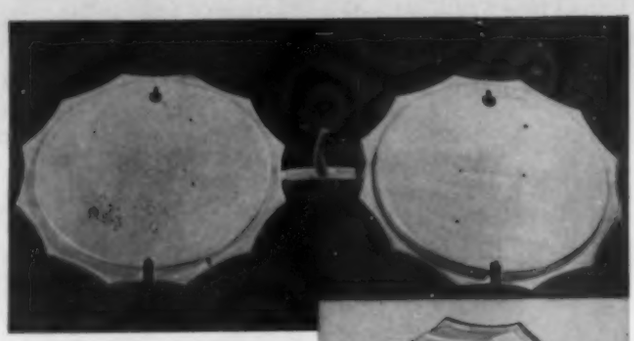

Clock backs are molded of a metallic polystyrene in a two-cavity injection mold

Trim wall clock comes in colors of green, red, ivory, or white to harmonize with kitchen decor

Plastic Replaces Metal in Clock Back

PLASTICS have become widely accepted materials in the design of clock cases in recent years. The Appliance and Merchandise Dept., General Electric Co., Bridgeport, Conn., has gone a step further in the design of its Model 2H02 kitchen clock and replaced a polished aluminum back with one made of polystyrene. It is reported that costs for this part were cut by 40 to 50 percent as a result of this material change-over.

Polystyrene back and case

This trim wall clock was originally produced with a polished nickel bezel and a urea formaldehyde case. It is now being made with a polystyrene case, a steel bezel sprayed in a metallic color, and a polystyrene back, also in a metallic color. The painted steel bezel and the metallic polystyrene were selected to harmonize with the chrome trim so highly favored by housewives in many types of kitchen appliances.

Rogers Plastic Corp., North Wilbraham, Mass., molds the backs of the clocks of metallic colored Lustron polystyrene in a two-cavity injection mold. A single-cavity injection mold is employed by Northern Industrial Chemical Co., South Boston, Mass., to produce the clock cases. The cases are also being molded in polystyrene and are available in green, red, ivory color, or white to harmonize with kitchen decor. Lustron polystyrene is used to mold the ivory colored and green cases; Styron polystyrene is used to produce the red and white cases.

Problems of Fabricators

(*Continued from page 79*)

tors who produce thinner than 4-mil calendered film.

Variation in the weight of vinyl film is by no means the only film problem that may confront the fabricator when he starts working his material. Non-uniform edges, uneven selvages, bellied film, rough surface, thick spots, and printing problems all contribute to fabricating difficulties that require all sorts of adjustments. And to make his problem more complex, the average fabricator has had to develop new techniques for judging the quality of his purchased film. He is practiced in judging the quality of fabric by the feel, by the count and weight of the fibers, and by many other time-tested methods. But fabrics have certain standards, such as predetermined staple length and other measurable characteristics, of which there is no counterpart in vinyl film.

Fabricators have had to develop their own methods for determining quality of purchased goods, and their ability to so choose is based largely on the experience and skill of the particular fabricator involved. Consequently, they are hopeful that the vinyl industry will hurry its combined efforts to establish standards so that the film purchaser may more readily determine the quality of his material. At present, the only thing he can determine for sure is the weight and width of the purchased film.

Labeling is important

Fabricators are also greatly concerned about labeling. They are confused by the plethora of trade names now current in the industry, many of which are completely meaningless to them. Few of them are satisfied with the labeling situation. Since most goods intended for the housewife bear some sort of a tag anyhow, they feel that such a tag might be much more advantageously used than at present. One fabricator suggests that the tag contain information which would assure the purchaser that she was obtaining the right film of the right weight for a given purpose; how to use it; how to take care of it; something about whether or not it was color fast and perhaps the type of coloring involved. Also, since the buyer is unaware of the various qualities of film, the label might be used to indicate that the film is all virgin material or partly reprocessed, just as is done in wool labeling. This would help the customer become acquainted with the fact that plastic films vary in quality and composition.

Perhaps the most vigorous head scratching now going on among the fabricators is whether they should sew or heat-seal their various items. There seems no doubt that stitching is today the most widely used method for fastening pieces of vinyl film together, but there appears to be a growing opinion that eventually heat sealing will be more

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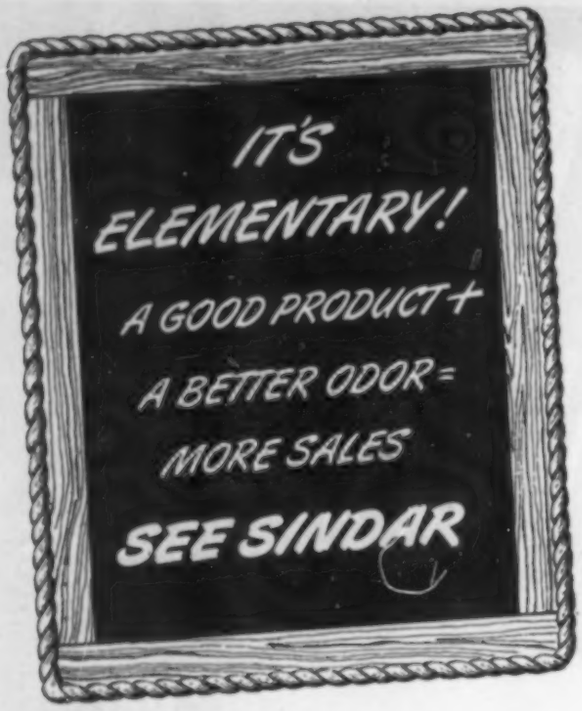

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universal than stitching. Nevertheless, there are a great many possibilities to investigate before a complete switchover from sewing to heat sealing can be undertaken.

One fabricator, for example, paid $16,000 for a sealing machine and is having trouble which he says is due to variations in film thickness, as well as mechanical difficulties. He expects to solve his problems soon and says he will be able to turn out many more and better shower curtains after the machine starts functioning satisfactorily.

This same man has developed an efficient mass-production line for sewing and assembling his shower curtains. On this assembly line two 36 in. widths of vinyl film precut to proper length are gathered together, clipped end to end with a stitch or two, and started down a wooden chute. The first sewing machine operator sitting alongside the chute sews the two lengths together down the center and the seamed piece passes to within reach of the second operator who puts in the side seams. Another operator stitches the bottom hem and a fourth operator inserts a reinforcing strip and seams up the top or "head". Continuing on their journey, the curtains go to a Stimpson grommeting machine where an operator quickly inserts the grommets, and the curtains are ready for packaging. The assembly line is doubly useful in that operations can be changed over to table cloth covers whenever desired.

Efficient as is this mass-production operation, the manager points out that when his electronic sealer is working properly, he can produce 15 times more curtains per man hour than he can by sewing machine. This electronic machine has several unit parts which, respectively, seal the two 36-in. pieces together, put in the hems along the side, seal on the top strip or head, and hem the bottom.

Machines must be kept busy

It must be pointed out that the big question involved in planning an investment in heat-sealing equipment is the possibility of operating on a big enough scale to keep the machine busy, especially when it is realized that one operator can produce 100 curtains a day by hand machine sewing. Lack of ability to use a sealing machine for processing other items than curtains might also prove costly. Only big volume plants can afford expensive machinery, and there are already signs that some of the smaller operators have fallen for the urge to install more equipment than they can keep busy, with the result that cut prices and other distress signals are flying here and there.

NEXT MONTH: *The third installment of this series will include a discussion of factors in electronic bonding, other mechanical processes used in fabricating plants, and more details on types of finished products.*

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Plastics on the Wall

(*Continued from page 75*)

added to the paste (to prevent possible discoloration due to mildewing while the paste is drying); and 4) special care is exercised to insure good contact with the wall at all points—particularly at the seams.

Vinyl sheeting

Although more familiar as a material for shower curtains, draperies, and furniture upholstery, vinyl sheeting has a number of properties which make it a desirable wall covering. Resistance to staining and the ease with which the material may be cleaned are two of its major virtues in such applications.

In the new employes' cafeteria recently opened by Union Carbide and Carbon Corp. in its New York City headquarters, a dramatic wall treatment has been obtained by using Kalistron[1] Vinylite sheeting in brilliant fiesta colors of red, green, and yellow. B. F. Goodrich Co., Marietta, Ohio, reports that it has done considerable experimental work on the application of Koroseal as wall covering, but that up to the present time, outlets for sale of the wall covering material on the open market have not been established.

In the new showroom of the Harry Newman Motor Sales Co., Detroit automotive dealers, lower walls of dark red Kalistron in a tufted effect are used in combination with upper walls of plywood. In addition to its attractive appearance, this wall treatment has greatly simplified maintenance, eliminating scuffing and the need for frequent plastering and painting.

Kalistron, manufactured by Deco-Plastics, Inc., is distributed by United States Plywood Corp., New York, N. Y. Available in a wide variety of stock and standard colors, as well as special colors if required, the material consists of a transparent sheet of special Vinylite plastic with the color fused to the underside, producing unusual richness and depth. The color is then protected with a suede-like backing.

Practically mar-proof, Kalistron will not scuff, scratch, chip, crack, or peel. It is almost completely impervious to moisture; the color, being applied to the reverse side of the sheet, is permanent. The product is particularly recommended for walls of hotels, hospitals, railroad cars, theater lobbies, etc.

Kalistron can be applied to plaster walls or other porous surfaces by normal paperhanging techniques, using water soluble adhesives. It is furnished in rolls from 90 to 100 ft. in length by approximately 47 in. wide. U. S. Plywood recently announced a series of seven matching and five harmonizing colors for Kalistron and Micarta, a high-pressure phenolic laminate which it also distributes. The new color combinations were designed to assist furniture

[1]Kalistron received the Seventh Modern Plastics Competition Award in 1948 in the Furniture and Interior Decoration category.

manufacturers, architects, and designers in the effective treatment of walls, table surfaces, and upholstered pieces.

A stitchless quilted vinyl material called Sealtuft, manufactured by The Jason Corp., Hoboken, N. J., in a variety of colors, has found favor as a wall covering material as well as in upholstered chairs, bed headboards and other pieces. The filler of this quilted vinyl is a cellulose material claimed to be fire-retardant, and the back sheet is 4-mil vinyl film in clear color or vinyl impregnated paper. Front and back sheets are bar-sealed together in a diamond pattern through the cellulose filler.

Other vinyl combinations

Lifewall, a product of the Pantasote Co., Passaic, N. J., illustrates still another approach in the use of vinyls as wall covering materials. Lifewall consists of vinyl resin, pigments, and filler, calendered to a specially impregnated backing which provides additional body and a good surface by which it may be secured to the wall. Durable, easy to clean, and impervious to all ordinary stains, the material will not crack or peel. Because of its flexibility, Lifewall conforms readily to any wall contour, including any angle inside or outside corner, without the need for a metal molding. It applies directly to the wall surface without expensive preparatory work, and is bonded by special cements.

Although designed originally for use in bathrooms and kitchens—steam will not faze or fade it—the wide acceptance of this material has pointed the way to many additional types of installations. Today it is not uncommon to find Lifewall in living rooms, dining rooms, halls, rumpus rooms, etc. The product is offered in 20 colors selected and styled by experienced colorists, and comes in rolls of 50-in. width; one roll covers approximately 40 square yards. Pricewise, Lifewall is described as "one of the most competitively priced permanent wall coverings."

Among the important industrial and commercial installations of Lifewall, comprising in some instances as much as 40,000 sq. yd. of the material, are those in the House of Calvary Hospital and Chase National Bank in New York City, Tulane University, and a number of Sears, Roebuck and S. S. Kresge stores. Burroughs Adding Machine Co., Detroit, has a large installation in its employe dining room and plans further use of the material. Johnson & Johnson Pharmaceutical Corp. is using Lifewall for most wall areas of its Artho Products factory in New Jersey.

On new home construction, Levitt & Sons, Manhasset, N. Y., which completed more than 5000 homes in 1948 and is the nation's largest builder, has specified Lifewall for the two baths and kitchen of its 1949 homes.

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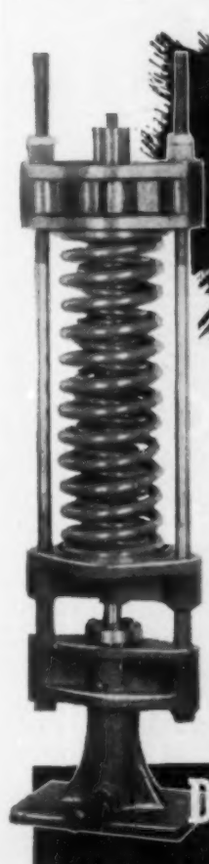

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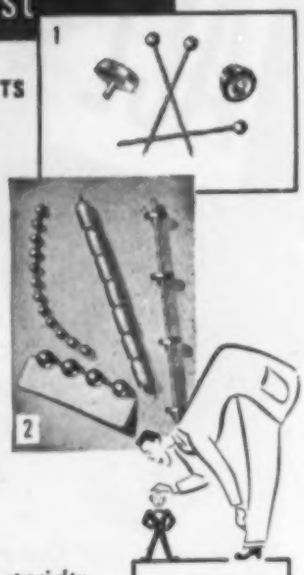

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gypsum plasterboard, Masonite, or plywood surfaces. The special Lifewall adhesives are applied directly to the wall surface and the material is hung vertically. The manufacturer recommends that all Lifewall for an entire room be cut and design matched before beginning to apply the material.

Wall-Ever Vinylite plastic wall covering, a product of Delaware Floor Products, Inc., Wilmington, Del., consists of a latex-impregnated non-woven backing on which a sheet of vinyl resin is cast. Colors are then printed in vinyl ink, after which a coating of clear vinyl is applied to provide a protective covering. Wall-Ever is printed in eight pastel colors and there are two-tone effects with one color.

This material is also available in several patterns in 48-in. widths, including a nursery design and marble, mother-of-pearl, and tile effects. The regular colored materials come in rolls 54 in. wide, containing approximately 50 square yards. The material easily conforms to wall contours.

Thanks to its vinyl surface, Wall-Ever resists grease, water, syrup, catsup, etc., and may be cleaned with mild soap and water. It is also highly resistant to scuffing, crazing, cracking, and peeling; colors are fade-resistant; it suffers no ill effects when exposed to kitchen or bathroom steam.

A special type of adhesive, made by Minnesota Mining & Mfg. Co., is used in applying Wall-Ever.

Woven wall covering

Fabric wall coverings are nothing new; their use preceded the development of wall paper. However, wall coverings of woven plastic filaments are one of the newest developments in this field.

Saran (vinylidene chloride) is the material being used for this purpose. The new application is a logical outgrowth of favorable experience with automotive seat covers, long-wearing upholstery, and insect screening that requires no maintenance.

The Lumite Div., Chicopee Mfg. Co. of Georgia, has announced the first theater installation of its new Lumite wall covering at the Apex Theater, Washington, D. C., where the material is employed to cover the walls of the women's lounge. The Apex installation features a grey stripe pattern and a ribbed weave. Chicopee has already created a variety of designs, patterns, and colors for furniture upholstery and wall covering, including plaids, monotones, bright colors, and pastel shades.

According to the general manager of the chain operating the Apex Theater, "the Lumite plastic wall covering is the best material we have found for beauty, utility, and economy. Writings and smear marks caused by lipstick, ink, and soiled hands are easily removed with a soapy cloth." He further pointed out that while the installation cost was a little higher than for ordinary coverings, the material was more economical because of its long life, easy maintenance, flame-proof qualities, and su-

perior durability. The fabric was applied to the walls of the room with Acryloid B-7 adhesive, made by the Resinous Products Div. of Rohm & Haas Co.

Paper-cellulose combinations

Despite the rapid rise of the vinyls in the wall covering field, either as unsupported films or in combination with other materials, the cellulosics continue to play an important role in the field.

Wall paper that can be washed with soap and water is made by Richard E. Thibaut, Inc., New York, N. Y., by laminating to its surface an 0.00088-in. film of cellulose acetate. Ink, lipstick, and other stains can be removed without damaging the paper, which is suggested for use in hotels, hospitals, restaurants, and other locations where heavy usage is encountered.

In the fall of 1948, The Ullman Co., Inc., Brooklyn, N. Y., introduced a line of 21 "Tru-Grain" wallpapers in woodgrain, marble, and bamboo weave designs. This product, combining beauty and ease of application with unusual durability, consists of a combination of paper and cellulose resins which impart the special protective properties.

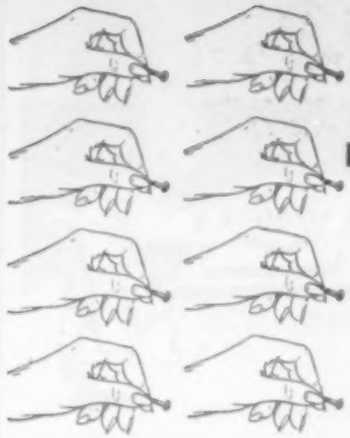
The paper—a free sheet made of wood pulp—is coated with a nitrocellulose combination lacquer before the photographic wood grain reproduction or other type of pattern is printed. After this surfacing operation, the printing is done in a variety of colors, using the same type of cellulosic resin as vehicle for the ink. A second coat of the resin is then applied over the printing for the final degree of protection.

Tru-Grain is water and alcohol resistant, stain proof, grease proof, scuff proof, and sunfast, according to the manufacturer. Using a lather of mild soap and warm water, such stains as the following can be easily removed without impairing the surface: lipstick, pencil marks, gravy stains, crayon, ink markings, grease spots, food particles, mildew, or mold. The plastic-covered surface may actually be scrubbed without harm in removing stains.

For installations requiring exceptionally heavy wear, wax or varnish may be applied to Tru-Grain, although this procedure is usually unnecessary. A sample section of the material, laid over linoleum and coated with four applications of clear varnish, has stood up well for 16 months under heavy traffic on an office floor.

Tru-Grain may be hung as easily as any other wallpaper, using regular wheat paste. It comes in rolls measuring 31 in. wide and 5 yd. long, priced at $3.00 per roll. The product is not limited in its application to wall covering, but may also be used for table top surfaces, fireplace panels, lamp shades, etc.

NEXT MONTH: *The concluding part of this survey of plastics in wall coverings will cover polystyrene wall tiles, high pressure laminates, coated hardboards, polyester laminates, etc.*



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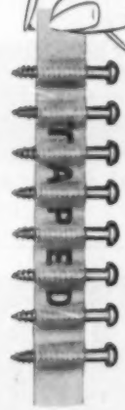

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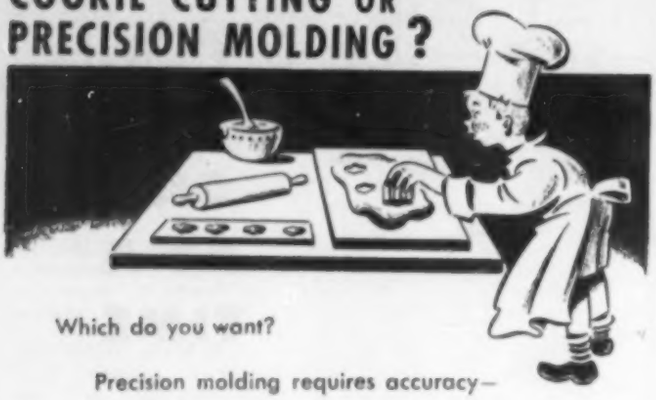

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Agricultural Residues

(*Continued from page* 115)

Unless other wise stated, the tests conformed to the requirement of A.S.T.M. D700-45T.[3]

Results and discussion

Strength properties, water absorption, specific gravity, and hardness values of 27 residue-filled, 2 woodflour-filled, and 3 commercial compounds molded at 320° F. are summarized in Table I. The results show that the residue-filled compounds in general develop strength characteristics equal or superior to both the experimental woodflour-filled and the commercial compounds. Compounds from the harder nut shells and corncobs exhibited exceptionally good flexural and tensile values. Only five compounds (hard and soft almond shells, corncob low-density components, corn stover, and corncob beeswing) exhibited water absorption values greater than those for the commercial compounds. Only one compound (beeswing) had an absorption value greater than allowed by A.S.T.M. specifications. Surface appearance of residue-filled compounds was superior to that of the commercial compounds following the absorption tests.

A molding temperature of 350° F. was found to be more suitable than 320° F. for development of flexural and impact strength of the commercial compounds. Similar molding conditions for representative residue-filled compounds caused no significant difference in flexural strength although a slight decrease in resistance to impact was noted. Comparative data for moldings at 320 and 350° F. are shown in Table II.

A molding temperature of 350° F. also proved to be more suitable in developing resistance to absorption in boiling water and to cracking of bottle closures following the boiling water tests. Results of the boiling water tests are presented in Table III. Bottle closures for practically all residue-filled compounds were resistant to cracking after molding for 30 sec. at 350° F. This resistance is equivalent to that of the commercial compounds. Although no specification has been established for resistance to absorption in boiling water, comparison of results can be made with those for the commercial compounds and the woodflour-filled compounds. The absorption values for compounds filled with flours from the harder nut shells are essentially equivalent to those of the commercial compounds. Of the residue compounds under consideration, nine showed boiling water absorption values greater than those of the woodflour-filled compounds. These compounds were filled with flours from corncobs, corncob beeswing, corncob low-density components,

[3] "A.S.T.M. Standards 1945." Part III, pp. 350-3. Philadelphia: American Society for Testing Materials.

corn stover, cornstalks, flax shives, peanut shells, and hard and soft almond shells. In general, these residue flours contain a higher percentage of water-solubles that can account for the higher absorption values obtained in the boiling water tests. The presence of oils or waxes in hard almond shells was indicated by an exudate on the surface of the molded compounds. This exudate interfered with proper molding of specimens.

Flow and cure characteristics of residue-filled compounds are equivalent to those of commercial general-purpose compounds. Comparative characteristics at 300 and 350° F. and 700 p.s.i. pressure are presented in Fig. 1. The volatile contents for the experimental compounds and the commercial compounds were essentially the same, so that moisture could not be considered as influencing the differences in flow and cure characteristics. Flow and cure characteristics comparable to those of commercial general-purpose compounds are retained by many residue-filled compounds even though the resin-flour ratio is 40:60. These characteristics are exemplified by No. III curves (filbert shell compound) in Fig. 1.

While these studies have been made with a single phenolic resin, other phenolic resins have been shown to be satisfactory in preparing molding compounds containing some of the residues considered here.[2,4]

Summary

Flours from agricultural residues including nut shells and fruit pit shells can be used as fillers in phenolic molding compounds of normal resin content to develop physical characteristics equal to or superior to three commercial general-purpose compounds molded at 320 and 350° F. All the experimental compounds with the exception of the compound containing corncob beeswing had water absorption values well within the limits of A.S.T.M. specifications.

Resistance to absorption in boiling water varies with type of residue, the harder shell compounds having values comparable to those of commercial general-purpose compounds. Values for the compounds filled with residues of high water-solubles content are higher than for the experimental compound containing woodflour. Resistance to cracking following immersion in boiling water is excellent for the residue-filled compounds molded at 350° F.

Flow and cure properties of residue-filled compounds are equivalent to those of commercial compounds. Satisfactory compounds having a resin-flour ratio of 40:60 can be prepared from many of these residues, especially nut shells and fruit pit shells.

4"Agricultural Residues in Plastics. Part II. Plasticizers and Inorganic Extenders in 25-Percent Phenolics," by R. V. Williamson, T. F. Clark, and T. R. Naffziger, MODERN PLASTICS 23, 177 (Feb. 1946).

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THE PLASTISCOPE*

INTERPRETATIONS OF THE CURRENT NEWS

By R. L. VAN BOSKIRK

Urea capacity and consumption

FROM the production figures issued by the Census Bureau, one could deduce that capacity of urea molding powder production in this country is somewhere in the neighborhood of 5,000,000 lb. a month. In the first quarter of the year, sales were running between 2,000,000 and 3,000,000 lb. monthly. There was a moderate slump early in the year from late 1948 sales, but a sharper drop in May.

In late 1948, molders were purchasing urea molding powder in anticipation of orders which they didn't yet have. Their customers built up large inventories of urea molded items which lasted through the first two months of 1949. These inventories were worked off by March, and the customers started ordering again. This increase did not show up to any extent in the urea industry's production figures because the molders 1) dipped into their own built-up inventory of molding material; 2) ceased buying urea unless they had orders booked. This adjustment is probably current to a great extent in all plastics purchasing today. In other words, molders are no longer worried about the shortage of material; are less likely to build up inventory; and are more likely to buy only for orders in hand.

Buttons are still the largest outlet for urea molding powder even though a price war has been waged in that phase of the industry. There is one button manufacturer which alone can consume as much as 200,000 lb. of urea a month, but is now operating 10 presses on two shifts five days a week, in comparison to more than twice that many presses operated around the clock during the immediate post-war period.

Specific urea uses—But the situation in the button industry is confused because so many new comers have entered the field. Where a raw materials producer once sold to 10 button companies, he may now sell to as many as 30. The volume of urea going to buttons is thus still substantial and is off no more than proportionally in comparison with other items. It is estimated that 70% of all small buttons, such as those used on shirts, underwear, pajamas, and similar items, are now molded in urea.

Urea closures and jar caps for cosmetics are still suffering from the decline in the cosmetics industry which set in as far back as 1946 and 1947, but there is evidence of a gradual increase. The urea producers are confident they will retain this market.

Electrical fixtures in urea are holding their own despite the inroads made by other plastics when urea was short. Recent tightening of Underwriters' specifications will re-emphasize the importance of urea in this field.

When queried about the use of urea in phone bases, which was current in Europe before the war, producers say that attempts were made to merchandise urea telephone bases in this country but that they frequently cracked due to the dryness of the atmosphere in comparison to the humidity prevalent in England.

Tooling costs—Large moldings in urea have been slow to take hold. One of the reasons given is that there are not enough manufacturers willing to put up as much as the $100,000 which is sometimes needed for big tooling jobs.

A good quantity of urea is still going into radio cabinets, and producers feel that phenolic is still their greatest competitor in this category. A television cabinet molded with cellulose-filled urea and weighing as much as 19 lb. is now under development. Industrial toilet seats requiring from 5 to 5½ lb. of urea are also now being molded in quantity lots by at least one molder.

Producers point out that the urea industry could be helped considerably if new molds built for production of phenolic housings or large parts were constructed with the idea that parts made from urea might some day be desired from the same mold and certain allowances were made for that purpose.

Fast-curing urea compounds have been a great help to the industry by saving up to 25% in curing time. They have been used primarily on closures and buttons but are not a panacea for all urea molding problems. Experts say that when speed of curing is increased, the duration of flow is decreased and that, on heavy pieces, the finished item is likely to be more like cast than molded material in that it doesn't cure out in the center.

Producers are now manufacturing a molding material of much more uniform bulk and granulation than in earlier days. As a result, the molder suffers less scrap loss, has fewer rejects, and has less difficulty in changing from lot to lot; in other words, he is assured of a uniform material at all times.

Tailor-made compounds—It is also no secret that producers are developing new urea compounds pointed at definite fields. They recognize that urea is a special-purpose material and are working along those lines. At the same time, they are striving to improve the properties of the compounds.

A urea that could be used more freely for pre-heating and in transfer presses; one with better dimensional stability or lack of shrinkage; or one that had greater flexibility would be a great boon to the industry.

Producers are also concentrating on enlarging the fields of application in which urea has already proven itself—scales, containers, housings, and other well-known urea applications. Since present capacity is comparatively limited, producers are not worrying too much about building up tremendous volume for the future for new outlets; they have no mountain to move in order to sell all that can possibly be made on present equipment.

Grinder for vinyls

A GRINDER which has been widely used in the processing of latices, lacquers, and paint for the past 10 years has been improved and is now receiving considerable attention from operators who compound organosols and plastisols. Known as the Szegvari Attritor, the grinder is engineered, serviced, and distributed by the Union Process Co., Akron, Ohio, and built in the

*Reg. U. S. Patent Office.

THE WORLD'S LARGEST TURBINE PLANT

Interior of General Electric Turbine Building, Heavy Equipment Area.

To meet the growing power demands of industry, General Electric Company retained Stone & Webster Engineering Corporation to design and construct at Schenectady, New York, its new turbine manufacturing plant.

The building, which is 650 feet wide by 1290 feet long, has a total floor area of more than 1,000,000 square feet. It required foundation construction of unusual design to carry the heavy loads to be superimposed on the manufacturing floor, which comprises nearly 20 acres.

This plant when in full production will be capable of producing each month enough turbine-generators to supply power and light for a city of a million inhabitants.

STONE & WEBSTER ENGINEERING CORPORATION

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THE PLASTISCOPE

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The machine uses much smaller flints or stones than the conventional ball mill. The Attritor has a stationary grinding tank in which a shaft with attached arms is the principle acting agent; the mixing is thus done by frictional drive rather than by the tumbling action of the revolving cylinder of the ball mill. The manufacturer asserts that this gives a greater grinding speed because of the greatly increased fine grinding effect. Furthermore, the tank is cooled by means of a water jacket in comparison to the more cumbersome sprinkling system generally employed in grinding other methods. Good temperature control is also claimed. The manufacturer states that the Attritor's action helps to eliminate trapped air bubbles.

Recently a unique pump and valve arrangement has been built in to the machine so that the grinding tank can be charged or emptied at a rate of 10 to 15 gal. per minute. The manufacturer claims that the machine will grind 10 times faster or better than a conventional ball mill, and that organosols have been prepared in as short a time as two hours.

The 80 to 128 gal. grinding tank capacity production machines sell at between $3500 and $4800, have vapor seals, and are explosion proof.

Wallboard conference

FINAL arrangements have been made for what is believed to be the first international wallboard conference to be held at Cambridge, Mass., September 16. It is sponsored by the Northeastern Wood Utilization Council with the cooperation of Harvard University.

The production of wallboards from wood wastes such as edgings, shavings, and sawdust, will be featured at the meeting, and the relative advantages of a number of adhesives and pressing operations will be evaluated. One panel will discuss the continuous methods of manufacture, and another will deal with the potential markets for the wallboards thus produced.

In order to insure a round-table type discussion, attendance at this meeting will be limited to 75. Invitations can be secured by corresponding directly with the secretary of the Northeastern Wood Utilization Council, Edgar L. Heermance, P. O. Box 1577, New Haven 6, Conn.

More cast vinyl film

CAST vinyl film of 2 mil thickness is now in production at Goodyear Tire and Rubber Co., Akron, Ohio, on a large-scale basis. The company plans to use two of its new casting units in the Akron plant for vinyl; the other three units in Akron are in production on Pliofilm to augment the production in Goodyear's St. Marys, Ohio, plant. A goodly portion of the Pliofilm production is now being used for oleomargarine wraps. The cast vinyl film is expected to be used for such items as lightweight drapes, bowl covers, etc. The company will, of course, continue to market its 4-mil calendered vinyl film; and its entrance into the cast film field is thought to be an answer to competitors who are putting calendered film on the market in less than 4 mil thickness.

Polyethylene seat covers

THE plastics industry noted with interest the recent announcement that Reeves Brothers, Inc., 54 Worth St., New York 13, N. Y., was ready to merchandise its woven polyethylene seat covers for automobiles, busses, trains, etc. The industry was well aware that this development was underway, but it was not generally known that the necessary technique required for overcoming production problems had been perfected.

Reeves Brothers has been in the textile business for more than a quarter century as a manufacturer of cotton fabrics such as combed cotton gabardines, poplins, and broadcloths. The firm is reported to have complete facilities for extruding, weaving, and finishing plastic fabrics in a wide variety of patterns.

Smaller molded pieces

WHILE there is a growing tendency in the plastics industry to concentrate on larger molded pieces, some molders have not forgotten that one of the original and most profitable plastic products outlets has been small specialties, novelties, and sundries. Thus, the latest item of that caliber, produced by the Waterbury Companies, Inc., Waterbury, Conn., is a miniature hanger which can be used for hanging up stockings, handkerchiefs, gloves, etc. Each hanger will hold two items, and has a revolving hook for suspending it from a shower curtain rod, display rod, etc. The hanger, about 3½ in. long has a base molded of cellulose acetate in a 12-cavity die. The hanger retails at two for 25 cents.

The same company is also merchandising a small home telephone memo pad holder of polystyrene. The top part of the base can be stamped, decaled, or ink printed by the purchaser or the molder, and the job is intended as an advertising novelty. If sold at a retail counter, the price, with the paper fill, is about 15 cents.

The market for advertising novelties is again on the upswing, according to molders, since the development of a buyers' market. The tougher the market is to sell, the more premiums will be used, according to advertising authorities.

Silane production

REPORTS are current that the Plaskon Div., Libbey-Owens-Ford Glass Co., is now in semi-works production on a new series of silanes (silicone intermediates) for use in manufacturing silicone or silicone modified resins. It is believed that it may also be possible to use silanes for the modification of other polymeric materials to impart the properties inherent in silicon-bearing compounds, including greater heat resistance.

In addition, silanes can be used as waterproofing agents, water repellents, hydraulic fluids, and antifoaming agents.

It is reported that the Plaskon silanes can be manufactured at a relatively low cost, which, of course, means that silicone resins may eventually be obtained at a lower price than presently.

Vinyl window shade

DEVELOPMENT of a new flame-retardant window shade made of unfilled cotton cloth sealed with vinyl plastic has been announced by Stewart Hartshorn Co., 250 Fifth Ave., New York 1, N. Y. Called Diana Fyrban, the shade is said to smudge or char slightly on application of a steady flame but does not flare up and burn. It has been certified flame retardant by the

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U. S. Testing Laboratories. The material is manufactured in standard widths mounted on Hartshorn rollers and may also be ordered in piece lots or in custom-cut sizes on either wood or steel rollers.

PMMA handbook

THE 1949 revised edition of the handbook "How to Buy and Sell Plastics" has just been released by the Plastic Materials Manufacturers Assn., Inc., Tower Bldg., 14th and K Sts., N.W, Washington 5, D. C. The first edition, which made its appearance in late 1948, has been completely exhausted. Because of the great demand, a new edition was deemed necessary.

The purpose of the booklet is to acquaint retailers in particular with plastics nomenclature and give them a brief summary of the differences between various types of plastics products. The booklet also suggests steps to take in training sales personnel and advises where to obtain motion pictures and lectures by members of the industry that may be used as training aids.

Many complimentary letters have been received from merchandisers who used the first edition, and demand for this booklet has by no means subsided. It is available in limited quantities to those directly associated with merchandising people.

Vinyl film draperies

ANOTHER variation in the increasing number of low-cost vinyl draperies coming to market has been announced by the Clopay Corp., Cincinnati, Ohio.

The draperies are of 4-mil calendered film and are printed by a recently perfected process print which gives a brocade-feeling; that is, to sight and touch, it appears that the printed design is raised, but it is not embossed. Called the Pallet-Print process, the new patterns are printed in 12 colors (unlike the 4-color rotogravure) with a variation of letter press printing, using zinc plates and great quantities of ink.

Each panel is approximately 30 in. wide and 2½ yd. long and is equipped with an automatic French pleater through which the curtain rod is inserted when the drapes are hung, giving a pleated or "tucked-in" effect. The edge of the draperies has been treated with a special process to prevent curling and assure the soft folds hanging straight. The draperies sell for $1.98 retail per pair.

A second style, called Textured Cloth, gives the appearance of a heavy woven fabric with a three-dimensional effect and retails for $1.79 a pair. Other styles in 4-mil vinyl drapes sell for $1.39 and $1.00.

Clopay has been noted for years as an outstanding manufacturer of specially treated paper drapes which have sold for as low as 98 cents. The company's advent into the vinyl drapery field with prices such as those quoted above is considered highly significant in the vinyl industry. It has been estimated that from 30 to 50 million pairs of paper drapes have been sold annually for the last few years.

Silk screen printing

SPECIMEN sheets incorporating a planning aid for fine silk screen color printing in specific applications are available from the Pied Piper Press, 225 Lafayette St., New York 12, N. Y. The silk screen process is the youngest of all printing methods, but because of its versatility it is used today on almost any material and for almost any purpose. The Pied Piper Press has serviced the advertising industry and manufacturers with silk screen color printing for many years and is now attempting to provide a buyer's guide to the layman on the use of the process through its series of specimen sheets.

Plastic plating

FORMULATED especially for platers of plastic products is a new and efficient fast-curing baking enamel recently introduced by Schwartz Chemical Co., Inc., 326 W. 70th St., New York 23, N. Y. Called Rez-n-Lac Baking Enamel, a companion to the previously announced Rez-n-Lac Air-Dry Enamel, its outstanding features include good adhesion, abrasion resistance, scratch resistance, and permanent flexibility, according to the manufacturer. It is receptive to aluminum and silver coatings, as well as to dip dyes, and is therefore recommended by the manufacturer for use both as an under-coat and over-coat on metallized plastics.

Described as 50% faster in curing time than conventional baking enamels, Rez-n-Lac sets in 30 min. at 150° F. The baking time can be reduced proportionately with an increase in temperature. Over-baking will not cause discoloration, according to company reports. The new baking enamel is pale straw in color and non-oxidizing in nature.

Monomeric plasticizer for vinyls

COMMERCIAL availability of Monoplex DOA (di-iso-octyl adipate), a monomeric plasticizer of unusual efficiency, has been announced by the Resinous Products Div., Rohm & Haas Co., Philadelphia, Pa.

Produced as a distilled ester of high purity and excellent color, the material is said to function well as a plasticizer for light and heavy weight vinyl film—supported and unsupported—for organosol and plastisol compounds, for molded and extruded vinyl stocks, and as a modifier for vinyl emulsions.

Logoquant price reduction

REDUCED prices on Metallic Base Logoquant have been announced by Bee Chemical Co., 13799 South Avenue O, Chicago 33, Ill. The product is used in applying metallic powder finishes to either acrylic or polystyrene parts. At the new price, 45¢ per lb. in drum lots or approximately $3.30 per gal., the material can be utilized even on low-cost plastic items, the manufacturers point out.

Prices of pigmented Logoquant and Logoquant Spray Thinner have also been reduced.

A.S.T.M. committee

COMMITTEE D-20 on plastics on the A.S.T.M. met June 29 and 30 at the Annual Meeting of the Society in Atlantic City, N. J., to discuss results of a year's work on test methods and specifications on plastics' properties. These included tear resistance of plastic films (in cooperation with the Society of the Plastics Industry); haze and luminous transmittance of transparent plastics; changes in linear dimensions of plastics; stiffness vs. temperature properties of nonrigid plastics; resistance of transparent plastics to

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"Air-Flight Circulator" molded and distributed by W. W. Welch Company, Cincinnati 2, Ohio

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DOW plastics

THE PLASTISCOPE

surface abrasion; methods of sampling and testing plasticizers; recommended practice for transfer molding specimens of phenolic materials; and recommended practice for maintaining constant humidity by means of aqueous solutions.

In addition to these new methods, revisions of seven tentative methods of test and three specifications for materials have been completed. Committee D-20 is charged with the development of test methods and specifications applicable to plastics and their raw materials and to the finished products made therefrom. However, electrical tests and materials used in the paint and rubber industries are covered by other committees.

Cast vinyl film prices

A 5 to 16% reduction in the price of Reynolon 200 cast vinyl film was announced by the Plastics Div., Reynolds Metals Co., 19 E. 47th St., New York 17, N. Y. The series embraces film 1.75, 2, and 3 mils thick and in approximately 27 colors, including a transparent matte and metallics. The series is recommended by the company for draperies, bowl covers, machinery covers, shower curtains, and similar items.

The new price ranges from $1.00 per lb. in quantity orders under 50-lb. to 78¢ per lb. in carload lots. The cost per sq. yd. in 30,000 lb. orders would vary from 9.09¢ to 15.11¢, according to the thickness of the gage.

WPB alumni

FORMER members of the Chemicals Bureau of the War Production Board are planning a meeting in New York City the latter part of September or early October. Those interested who have not attended previous meetings are requested to notify Jack Conway, John H. Calo Co., Inc., 19 Rector St., New York, N. Y.

Stabilizer for vinyls

AN anti-oxidant stabilizer claimed to have unusually high heat and light resistance, coupled with excellent electrical properties, has been developed by the National Lead Co., 111 Broadway, New York 6, N. Y. Called Dyphos, this new stabilizer for vinyl-type plastics is the dibasic lead salt of phosphorous acid. It does not change color in use, and its breakdown products, as well as Dyphos itself, are insoluble in water or organic solvents, according to the manufacturer. Brochures and samples may be obtained from the company's research laboratories at 105 York St., Brooklyn, N. Y.

Japanese plastics

THE tabulation presented here of plastics production in Japan is interesting, despite the impossibility of interpreting the figures. Nevertheless, they do indicate the pattern of plastics raw material production which the Japanese have in mind.

Annual Japanese Plastics Production Capacity/Lb.*

Material	*Designed capacity*	*Workable capacity, as of Oct. 1946*
Celluloid	17,500,000	13,000,000
Phenolic resin	40,000,000	30,000,000
Urea resin	16,000,000	10,500,000
Methacrylate	2,000,000	1,300,000
Acrylate resin	650,000	390,000
Melamine resin	650,000	650,000
Ion exchange resin	105,000	26,000
Polyamide resin	28,000	6,500
Styrene resin	164,000	80,000
Vinyl acetate resin	2,000,000	300,000
Vinyl alcohol resin	1,600,000	1,300,000
Vinyl chloride resin	650,000	340,000
Synthetic rubbers:		
Butadiene	4,000,000	1,000,000
Chloroprene (Neoprene)	820,000	185,000
Thiokol	800,000	800,000

*Source: "List of Production Capacity of Chemical Industry in Japan (Oct. 1946)," Japanese Ministry of Commerce and Industry, Industrial Bureau, Chemical Section.

Urea price adjustment

THE price of Beetle urea-formaldehyde molding compound in Bureau of Standards colors is now 31¢ per lb. in any quantity of one drum or more, according to an announcement by the Plastics Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. This replaces a price scale under which the 31¢ price applied only to shipments of 30,000 lb. or more, while smaller quantities cost an additional ½ to 1¢ per pound.

Aluminum pigment in plasticizer

ALUMINUM paste #36 has been announced by the Pigment Div., Reynolds Metals Co., 19 E. 47th St., New York, N. Y., for the particular interest of the plastics industry. The aluminum particles in this new paste are specially polished to give the utmost in smoothness and brilliance and are in a carrier of dioctyl phthalate only, thus eliminating the difficulties usually connected with the use of dry aluminum powder.

Pigments

TWO new white pigments are being produced exclusively under U. S. Patent 2,307,239 by the Burgess Pigment Co., 64 Hamilton St., Paterson 1, N. J. These are "Iceberg" Pigments, an anhydrous pigment with 90-92 brightness, for use by the rubber, plastic, paint, ink, and other industries, and Burgess Pigment No. 30, for use in synthetic rubber and vinyl compounds.

Vinyl latex for paper coating

EXCELLENT abrasion resistance and a washable surface are obtained by the use of Geon latex, a product of the B. F. Goodrich Chemical Co., as an outer coating on fiber shipping drums. When packing fiber drums with some products, spillage necessitates subsequent washing of exterior surfaces, often made difficult when no coating or an inadequate coating is utilized. Geon latex is a water system and does not require the addition of solvents in formulation.

COMPANY NEWS

A. Bamberger Corp., 44 Hewes St., Brooklyn, N. Y., has appointed Arthur L. Metzger as sales manager of its Elastomeric Div., handling polyvinyl chloride, polyethylene, and related materials. Mr. Metzger was formerly sales manager of the plastics division of Meyer and Brown.

Vulcanized Rubber and Plastics Co., 261 Fifth Ave., New York, N. Y., has announced the election of Prescott Beach as president, general manager, and operating head. Stanley H. Renton, former president, has become chairman of the board

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for plastic, optical, celluloid and allied industries

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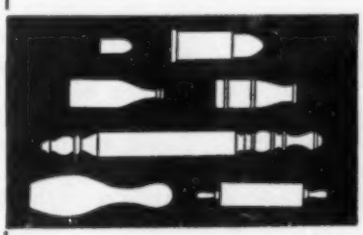

Illustrated here are several of the infinite number of shapes which we can grind for you from plastic, fiber, hard rubber, wood or other materials.

*Made from Kopper's Cellulose Acetate.

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of directors; John J. Noble, first vice-president; and Harold L. Smith, Jr., general sales manager.

Plastic Inlays, Inc., Summit, N. J., has retained R. M. Erosius as its Chicago representative, with headquarters at 2730 Elston Ave., Chicago 47.

Elmes Engineering Div., American Steel Foundries, has moved from 230 N. Morgan St., Chicago, Ill., to larger, more modernly equipped quarters at 1150 Tennessee Ave., Cincinnati 29, Ohio.

The Fellows Gear Shaper Co., Springfield, Vt., has announced the promotion of Cecil M. Peter, who has been general sales manager, to vice-president and general manager, with headquarters in Springfield. Leroy C. King, formerly eastern district sales manager, was made sales manager, with headquarters in New York; succeeding Mr. King as eastern district manager is Herbert W. Nickerson.

B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced the resignation of M. Scott Moulton as technical staff representative—plastic materials. Mr. Moulton plans to enter business for himself. O. E. Isenburg, formerly staff representative, has been promoted to the newly created post of field sales manager —plastic materials.

Owens-Corning Fiberglas Corp., Toledo 1, Ohio, has appointed E. W. Pat Smith as director of merchandising. Edward C. Ames, who has been director of advertising on an interim basis for two years, was named director of public relations and publicity.

Rogers Corp., Manchester, Conn., has added to its line of fibrous structural and insulating materials a phenolic punching stock in standard thicknesses. Formulations can be produced to meet special requirements, including combining a melamine cover sheet with the basic phenolic stock.

Elmer E. Mills Corp., 2930 N. Ashland Ave., Chicago, Ill., has again won an award in the annual competition sponsored by the Chicago Federated Advertising Club. The Mills Corp.'s advertising, which appears in MODERN PLASTICS was judged to be the best institutional industrial color advertising campaign produced during 1948. The Chicago office of Bozell and Jacobs, Inc., is the agency.

Jefferson Chemical Co., Inc., has moved its executive and sales office to new and larger quarters at 711 Fifth Ave., New York 22, N. Y.

Printloid, Inc., 93 Mercer St., New York 12, N. Y., has enlarged and modernized its printing department and is now equipped to print on all plastic materials by means of letter press, silk screening, and roll leaf stamping.

The company has recently developed a means of printing tiny colored pictures, using extremely transparent inks, where the details of the photos and the wording are so small as to require magnification to make them visible. These pictures can be viewed or projected.

Printloid also is engaged in plastic fabrication.

Goodall Fabrics, Inc., 525 Madison Ave., New York 22, N. Y., has announced that its sales of coated fabrics and plastics to jobbers and to industrial accounts will be handled by its Industrial Div. under the supervision of C. J. Dyer. Assisting him is Leonard Maclean, formerly of Zapon Keratol Div., Atlas Powder Co.

Marbon Corp., 1926 W. 10th Ave., Gary, Ind., has announced the appointments of C. R. Holt as technical service manager and H. H. Irvin as chief chemist.

American Insulator Corp., New Freedom, Pa., has announced the election of new officers as follows: J. Cornelius Rathborne, president; David A. Thomas, senior vice-president and general manager; and C. M. Norris, with the firm since 1925, vice-president.

William H. Hoyt, formerly manager of the Plastics Laboratory of International Business Machines Corp., has been named sales manager of American Insulator. H. E. Burke was recently appointed to the home office sales force, and John E. Currier as New York area representative.

Premier Tool & Manufacturing Co., Inc., has opened its new plant at 299-303 Wilson Ave., Newark 5. N. J.

The Formica Co., Cincinnati 32, Ohio, has announced a newly-created bobbin division, with R. P. (Rex) Bennett in charge. The move was made necessary, according to company officials., by the requirements of such man-made yarns as nylon and rayon for bobbins made of much tougher material than needed for natural yarns. Mr. Bennett will have charge of designing, developing, and promoting sales of these plastic parts.

Electro-Plastic Fabrics, Inc., a new company engaged in the manufacture of plastic rainwear, protective covers, and other industrial and consumer products, has been formed at 64 First St., N.E., Pulaski, Va. The company also offers consulting and laboratory service to users of plastic film which is to be dielectrically bonded, stitched, or heat solvent sealed. A small pilot plant is available for experimental use by customers.

Organizers of the firm are Richard Beaver, formerly of The B. F. Goodrich Co., and Dr. C. P. Sweeny, formerly with Singer Sewing Machine Co., Electrical Div.

Interlake Chemical Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio, has announced its complete withdrawal from the resin business.

Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y., has increased its coverage of the Cleveland, Ohio, area with the addition to its sales staff of Benjamin Steverman and Charles Tibbits as industrial salesmen. John Grotzinger, formerly handling sales and service work, is now assigned to field engineering.

Flambeau Plastics Corp., Bruce, Wis., has announced that its company and the Sioux Falls Plastic Co. have been combined into one unit in the Bruce location.

The Connecticut Plastilight Corp., Stamford, Conn., has appointed **The Laminated Building Materials Co.**, 86 Osler St., Toronto, and 4204 St. Catherine S.W., Montreal, Canada, as exclusive Canadian sales agents

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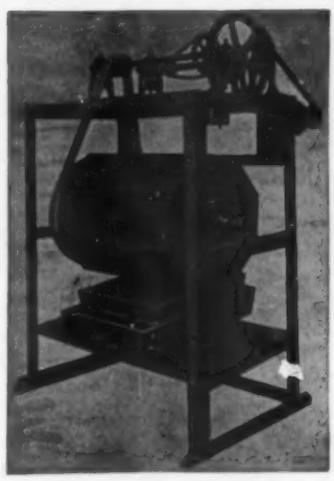

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New Situations Develop Constantly

SUDDENLY you have a problem . . . costs . . . complicated parts . . . poor deliveries . . . contract trouble. Naturally you turn to plastics.

But don't just say eeny-meeny-miny-mo and pick a plastic out of thin air. Call in the custom-molder and tell him all—why you don't like what you're doing—what the part is for—what it has to stand.

Custom-molders don't know *all* the answers—as we said before, new situations develop constantly—but the custom-molder *can* tell you the possibilities and the risks, if any.

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Boonton 8-2020

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MOLDERS OF MOST PLASTICS BY MOST METHODS

THE PLASTISCOPE

for Plastilight plastic surfacing for table tops.

The company has completed construction of a new addition to its plant, increasing floor space to 20,000 sq. ft., and providing a new showroom and offices as well as additional factory facilities. It reports a production record of 1,000,000 sq. ft. of Plastilight during the first 5½ months of 1949.

Millard Demarest, formerly of Celanese Corp. of America, has joined Whiteford Plastics Corp., 311 W. 66 St., New York, N. Y., as sales manager.

Joseph A. Hill, associated with Barnes and Reinecke, Inc., and later J. O. Reinecke Associates since early in 1943, has established his own industrial design office at 912 Clifton Ave., Glen Ellyn, Ill.

PERSONAL NEWS

P. S. Vincent, formerly technical representative of Pittsburgh Plate Glass Selectron resin products, has been named general manager, Rodic Rubber Co., New Brunswick, N. J.

Joseph D. Dreyfuss, who recently resigned as sales manager in charge of the Plastics Div., Susquehanna Mills, Inc., has joined William Whitman Co., Inc., 261 Fifth Ave., New York 16, N. Y., as sales manager of the Plastics Div.

Max P. Fisher has been named Northern California representative for Seal-Sac, Inc., New York, N. Y., with headquarters in the Western Merchandise Mart, San Francisco. The Seal-Sac line includes bowl and appliance covers and closet accessories.

Wm. F. Cullom has resigned as director of sales, Transparent Film Div., Celanese Corp. of America, which position he has held since 1943. After 13 years with the company, he is opening offices as a manufacturers' representative at 251 E. 35th St., New York, N. Y.

Frank B. Foster, formerly with Johnson and Johnson and Owens-Corning Fiberglas Corp., has joined the Industrial Products Div., Hess, Goldsmith and Co., Inc., 1400 Broadway, New York, N. Y.

Lorin B. Sebrell has announced his resignation as director of research and chemical products development of The Goodyear Tire and Rubber Co., Akron, Ohio. He has been affiliated with Goodyear continuously since 1922 and has been research director for the past 21 years.

John J. Littley has been appointed sales engineer for hydraulic presses and power tools of the Eddystone Div., The Baldwin Locomotive Works, Philadelphia 42, Pa.

Jackson Martindell, president of the American Institute of Management, New York, N. Y., has been elected a director of the Taylor Fibre Co., Norristown, Pa.

Phillip Morgan of *British Plastics Magazine* spent May and June in the United States to study trends in the plastics industry here and to attend the S.P.I. Convention in Chicago.

E. B. Osborne has been appointed sales representative by B. F. Goodrich Chemical Co., Cleveland, Ohio, to handle Geon plastic materials in Philadelphia and the adjacent area in addition to certain sections of Delaware and Maryland.

Rothe Weigel, executive vice-president of Victor Chemical Works, 141 W. Jackson Blvd., Chicago 4, Ill., has been elected president, to succeed the late Walter B. Brown. Elected to a vice-presidency was **Francis M. Anable,** general production manager. Mr. Weigel has been with Victor 25 years, and Mr. Anable, 22 years.

R. G. Kadesch has left his position as director of research for the Plastics Div., Reynolds Metals Co., Gary, Ind., to become research director of Emery Industries, Inc., Cincinnati 2, Ohio.

Dr. C. W. Kleiderer, Arthur W. LaCouture, and **Frank L. Hemingway** have been appointed territorial representatives of the sales staff of The Glenn L. Martin Co., Chemical Div., Baltimore 3, Md., for the distribution of Marvinol VR-10 and other products of the division. Dr. Kleiderer was in charge of the plastics division of the "proximity fuze" program and after the war served as director of research for the Ideal Novelty and Toy Co. He will cover the New York City metropolitan area for Martin. Mr. LaCouture, formerly with International Printing Ink Corp. and more recently with Archer Rubber Co., where he specialized in vinyl resin and rubber compounds for the coating of textiles and paper, will cover Ohio and adjacent nearby points; and Mr. Hemingway, formerly with Interchemical Corp.'s research laboratories on plastics research and pilot plant work, will cover the Chicago area east to Ohio.

Harold R. Williams, formerly with American Insulator Corp., New Freedom, Pa., has been appointed midwestern representative for Norton Laboratories, Inc., Lockport, N. Y. His office will be at 4500 Superior Ave.

Charles P. Walker, Jr., has been appointed general sales manager of Chas. Pfizer and Co., Inc., 630 Flushing Ave., Brooklyn 6, N. Y. **Franklin B. Albright** has been appointed field sales manager for the Midwestern region and will be located at the company's new offices at 425 N. Michigan Ave., Chicago, Ill.

Harold D. Cooper has been named Eastern District sales manager of Koppers Chemical Division.

E. S. Moreland, formerly with The W. S. Pursglove Coal Co., and, prior to that, general sales manager of the Pesco Products Div., Borg-Warner, has been appointed sales manager of Carter Products Corp., 10225 Meech Ave., Cleveland, Ohio.

MEETINGS

Sept. 6-8—Regional meeting, American Institute of Chemical Engineers, Mount Royal Hotel, Montreal, Que., Canada.

Sept. 11-Nov. 20—"For Modern Living" exhibition by Detroit Institute of Arts, Detroit, Mich. Only best examples of contemporary design for the home shown, including those made of plastics.

Oct. 10-14—First Pacific area national meeting American Society for Testing Materials, San Francisco, Calif.

Nov. 1-5—Pacific Chemical Exposition, San Francisco, Civic Auditorium, San Francisco, Calif.

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You'll find that Mirro-plex gold and silver finishes are your best bet for inexpensively transforming almost any lack-lustre plastic novelty into a fast selling, demanded article. These glistening simulated gold and silver platings add immeasurably to the appearance, sales-lure and market value of your plastic brooches, chips, sprays, earrings, charms, bracelets, combs and barretts and other plastic jewelry.

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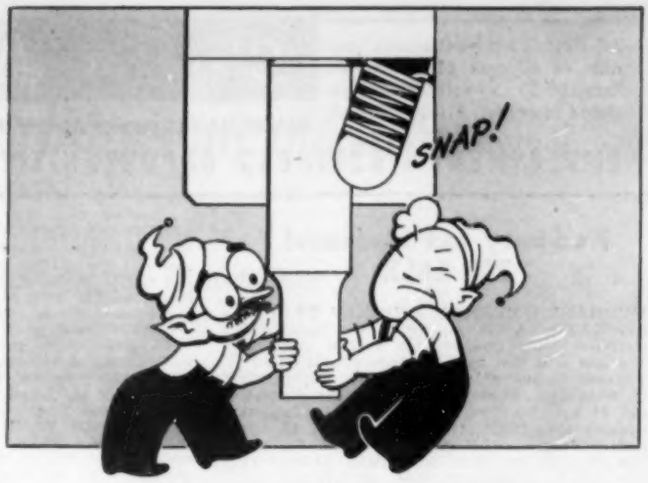

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ARE SECURELY POSITIONED
BECAUSE THEY'RE LOCKED!

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Because RB products are made from selected steels with closely controlled hardness, finish and tolerance, they are uniform and interchangeable. RB interchangeability keeps punch and die inventories low. It also enables press operators to make quick changes so that press "down time" is kept at a minimum.

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Machinery and Equipment FOR SALE

HYDRAULIC PRESSES REBUILT TO SPECIFICATIONS for plastic items, industrial purposes and phonograph record presses. We have in the used equipment (1) Baldwin-Southwark 8" x 8 ft. stroke, 2000# W. P. weighted accumulator $1000, (1) French Oil 8" x 42" stroke, 2500# W. P. weighted accumulator $600. (1) 400 ton, 32 x 45, 18" ram, 30" stroke, 13' daylight $2200, (1) 300 ton 30 x 46, 18" ram, 24" stroke, $1800, (1) 400 ton 22 x 30, 16" ram, 18" stroke, 36" daylight $1500, (2) 150 ton 42 x 46, 12" ram, 36" stroke, 60" day-light $900 each, (3) 24 x 24, 250 ton Southwark Presses with push-backs, 15½" ram, 15" stroke, 33" daylight $1450 each. Hydraulic Sal-Press Inc., 386-90 Warren Street, Brooklyn 7, New York.

12 AUTOMATIC PHONOGRAPH RECORD PRESS UNITS Hydraulic Baldwin Southwark 50 ton automatic tilting head press serial #45580. Taylor Flex-O-Timer No. 179RJ311, 23 x 40 steam plate and double shelf table, (1) 1¼" hydraulic high and low air diaphram valve, (2) ¾" hydraulic air diaphram valves, (1) Vickers high and low pumping unit, 5 H.P. motor, regulating valves, 70 gallon tank, and cooling system. Price $1800.00. HYDRAULIC SAL-PRESS CO., INC., 386-390 Warren Street, Brooklyn, N. Y.

SAVE WITH GUARANTEED REBUILT EQUIPMENT-HYDRAULIC PRESSES: 26" x 24", 12" ram, 400 tons; 36"x36", 19" ram, 425 tons; 24"x42" 340 tons, 2-12" rams; 34"x40" 22" ram, 475 tons; 26"x24", 18½" ram, 800 tons; 24" x 24" 18" ram, 318 tons; 24" x 24", 12" ram, 170 tons; 42" x 42", 16" ram, 250 tons; 36" x 52", 14" ram, 385 tons; 36" x 36", 12" ram, 141 tons; 24" x 26", 10" ram, 118 tons; 20" x 20", 10" ram, 118 tons; 19" x 24", 10" ram, 78 tons; 22" x 15", 8" ram, 75 tons; 15"x15", 8" ram, 75 tons; 12"x12", 7½" ram, 50 tons; 12"x12", 6½" ram, 42 tons; 8"x9½", 4½" ram, 20 tons; 16"x16", 3½" ram, 12 tons; Laboratory press 30 tons 6"x6"; NEW DUAL PUMPING UNITS, ALL SIZES; Worthington Triplex 12 gal. 2200#, 4 plunger 6 gal. 2000#; Watson Stillman duplex box type 1 gal. 2500#; Worthington 1 gal. 10000#; NEW LABORATORY 6"x12" M. D. MILLS; Thropp 16" x 40" M. D. MILL; EXTRUDERS, NRM size 1½" and 2½" Units; PREFORM MACHINES; Stokes R&T, Colton 5 & 8½ T Mixers, Accumulators, Vulcanizers, etc. UNIVERSAL HYDRAULIC MACHINERY COMPANY, 285 Hudson Street, New York City 13, N. Y.

FOR SALE—1—Watson Stillman Hydro-Pneumatic High and Low Pressure Accumulator System, complete; 1—Van Dorn Experimental Injection Molding Machine; Other Injection Molders up to 22 oz; 2—150 Ton Semi-Automatic Self-Contained Hydraulic Presses; 1—Royle #½ Plastic Extruder 1½" cylinder, other up to 8" cylinders; Two Roll Compounding Mills 6 x 12" up to 22 x 60"; Complete equipment for manufacture of molding powders. Send us your inquiries. CONSOLIDATED PRODUCTS CO. INC., 13-14 Park Row, New York 7, N. Y.

FOR SALE—Youngstown-Miller Plasticoater Model #4020, tank 30" long x 18" wide 20" deep, completely automatic and in good condition. Reply Box C1007 Modern Plastics.

ELEVEN STAINLESS STEEL TANKS 11' 10" dia. x 14' high with stainless covers, built-in filters, and hopper type discharge. Approx. 10,000 gal. capacity. Cost over $13,000.00 each in 1940. In excellent condition. Offered at fraction of original cost.

STAINLESS STEEL CENTRIFUGAL PUMPS Hazleton type, manufactured Barrett Haentjens:— 300 GPM, 30' head, 5 HP motor 150 GPM, 16' head, 1½ HP motor also Labour 10 GPM with 64' head, and many other makes and sizes. CONE BOTTOM STEAM DIGESTERS 8' x 30', ⅝" wall, ASME code U-68, 165# h.s. pressure; built-in steam baffles and deflectors, and screened std. 8" pipe, with suction head, in center. Self supporting steel pedestal-type base. In excellent condition. Approx. 10 years old. TANKS AND TANK SCALES TO 150,000# CAPACITY 8' x 30', ⅝" wall, welded, ASME code U-70, Wt. 25,000# 8' x 30', ⅝" wall, riveted, built for 60# h. s. working pressure, Wt. 25,000#. Capacity 11,000 gal. Large inventory of other tanks; all capacities and sizes. C. G. SARGENT LINTER DRYER AND FEEDER. Thirteen sections, complete with motors, drives, reducers, feeders, and all accessories, including conveyor and 4250' of coil pipe. Large inventory of Stainless pipe, valves, fittings, and cocks. GATES POWDER CRUSHER, CASKEY 16" DEHYDRATING PRESS, and many other chemical & Processing units available for sale. Mr. S. T. Dvorak, GELB & CO. of SCRANTON, Contractors, DUPONT FINISHES PLANT, PARLIN, NEW JERSEY, Telephone: South River 6-2826.

EQUIPMENT FOR SALE

14 Oil Hydraulic Units 500# Low 2000# Hi-Pressure Pumps 50 and 65 gal. reservoir, 5 to 10 H.P. Motors, complete with all operating valves. All in good operating condition. For use with Rubber or Plastic presses. YALE RUBBER MFG. CO., SANDUSKY, MICHIGAN.

DOUBLE ARM JKTD. MIXERS: 15 gal. B-P; 25 gal. Day; 100 gal. W&P; 250 gal. Read. Stokes rotary 16 punch pellet presses. PERRY EQUIPMENT CORP., 1529 W. Thompson St., Phila. 21, Pa.

FOR SALE: 100 Ton and 50 Ton Stokes Molding Press & Pumps; 300 Ton Dunning & Boschert, Molding Press; 300 Ton W. S. New Hobbing Press; 750 Ton Southwark Hobbing Press; 300 Ton W. S. Press 24 x 20 Platens; 175 Ton H. P. M. 30 x 30 Platens; 85 Ton Stewart Bolling 20 x 20 Platens With Electric Plates; 50 Ton 18" x 18" Elmes, With Electric Plates. Handpump Operated; 500 Ton Waterbury Farrel 3 Post Press; 800 Ton Waterbury Farrel 22" x 24" Platens; Stewart Bolling 50 Ton 14" x 14" Platens; 35 Ton Oilgear Shaft Straightener 84" Long Bed; Carver & Watson Stillman Lab. Presses; Hydro Pneumatic & other type Accumulators; Piston & Oil Pumps. AARON MACHINERY CO., 45 Crosby St., N.Y.C.

FOR SALE—ONE—NEW 9-OUNCE HASTELLOY HEATING CHAMBER (unused) for HPM injection molding machines models 200 and 250. Will sell at standard cylinder price. Reply Box C981 Modern Plastics.

FOR SALE: Injection Presses: 6 and 8 oz. Reeds, 16 oz. HPM, 6 and 12 oz. Lester, 1 oz. vertical NRK. Extruders: 1½" and 2½" oil heated NRM, 4½" oil heated Royle. Ovens, Granulators, Tumblers, Temperature Circulators. Apex round objects printing machine. 1 Hungerford blending & compound. unit. 20—100 tons Compress. Presses. 1—150 tons self containd. Compr. press. 1—Kux 60A Preformpress. Justin Zenner, 833 W. Sheridan Road, Chicago 13, Ill.

FOR SALE—One used National Rubber Machinery Company 40' Conveyor with 4" wide Belt. Reply Box C982 Modern Plastics.

FOR SALE 1—#1 Royle (2" diameter) Extruding Machine with 9 K. W. Hot Oil Heating Unit Machine never been used. SLATER BROTHERS, INC., 460 Totowa Avenue, Paterson 2, New Jersey, Lambert 5-1880.

FOR SALE
BY INJECTION MOLDER

One Used 7 Ounce HPM Injection Molding Press, in good operating condition. May be inspected in operation. Price $3750. Reply Box C983 Modern Plastics.

FOR SALE: Farrell 18" x 45", 16" x 48" & 15" x 36", 2 Roll Rubber Mills, New Lab. 6" x 12"; other sizes 30" to 84"; Royle #2 Perfected Extruder; 500 ton Hydr. Molding Press 42" x 48"; Field 500 ton 23" x 30"; Francis 200 tons; 24" x 18". Albert 100 Ton, 2 opening 24" x 24". Also presses 20 to 250 tons from 12" x 12" to 36" x 36" & 40 ton Broaching Press. Watson-Stillman Hor. 4 plgr. 1" x 2" x 4" H. & L. Pressure Pumps; HPM 1⅝" x 6"; vertical triplex 10 GPM 2700 lbs; 7 Hydr. Oil Pumps, Vickers Oilgear, Northern, etc. Elmes 1" x 4" & 1⅛" x 4" hor. 4 plgr. 5 to 8 GPM 4500 lbs. & 5500 lbs., Elmes 2" x 6" hor. 30 GPM, 2500 PSI.; Rumsey 4½" x 8" vert. Triplex 65 GPM 900 lbs.; Elmes 2½" x 4" hor. 17GPM 850 lbs.; Hydr. Steam Pumps; Low pressure Pumps 150 to 600 lbs. Hydr. Accum.; Stokes Automatic Molding Presses, Stokes Rotary Preform Tablet Machines 1 3/16", 1¼" and ⅝", also single punch; Injection Molding Machines 2 oz. to 12 oz.; Baker Perkins jacketed Mixers 200, 100, 50, 20, 9 & 0.7 gals. capacity; New and used Rotary Cutters; Rubber Mills; Calenders, Banbury Mixers, etc; Heavy duty Mixers; Grinders; Pulverizers; Gas Boilers, etc. Only PARTIAL LISTING. We BUY YOUR USED MACHINERY, STEIN EQUIPMENT CO., 90 WEST STREET, N. Y. 6, N. Y. WOrth 2-5745.

GOLDSTAMPING MACHINE FOR SALE. Used for printing on plastic. Will print up to five lines in one operation. Sturdy cast iron. Table model, $45. We have a few on hand. National Embossing Co., 17369 Riopelle, Detroit, Michigan.

Material For Sale

FOR SALE—ORGANOSOLS
3,683 lbs. White; 6,342 lbs. Yellow; 498 lbs. Red; 497 lbs. Green; 378 lbs. Bright Yellow. Over 11,000 lbs. of material still in original drums. Suitable for coating or dip coating. Attractively priced, original cost over $4,000 including drum deposit. Will dispose of entire lot for $2,500. For further information write Box C1008, Modern Plastics.

WILL SACRIFICE entire stock consisting of Lumarith sheets (25 x 55 inches)—Tenite shapes (angles, channels, strips)—masonite base boards—corrugated boxes—bolts and nuts—nut drivers etc. . . sawtable, drills, etc. . . all suitable toy manufacturers. Suite 1511 230 Fifth Ave. New York 1

FOR SALE

ETHOCEL .005 thick—dark color—new material. For sample and further information contact: Dictaphone Corporation, R. E. Worden, 375 Howard Avenue, Bridgeport 5, Conn.

(Continued on page 180)

Put the qualities you want into your plastics with...

SANTICIZER 141

SANTICIZER 160

Whether you want resistance to fire or water . . . need hardness or flexibility . . . or desire numerous other qualities in your plastics . . . it will pay you to investigate the possibilities offered by the Santicizers, versatile Monsanto Plasticizers.

SANTICIZER 141, compatible with most common base resins, is especially effective in polyvinyl chloride, polyvinyl co-polymers and Buna-N type synthetic rubbers. It is a non-toxic plasticizer imparting low-temperature flexibility, toughness and resistance to flame, moisture, oil and abrasion. It improves heat and light stability.

SANTICIZER 160 is especially developed for wide general compatibility. It is effective in vinyls, cellulose nitrate and ethyl cellulose. In extruding or calendering, its viscosity permits increased production rates or you can maintain your current production rate at lower temperature.

Santicizers 141 and 160 are but two of a long list of Monsanto Plasticizers, each having definite functions in plastics, coatings or rubber. Santicizers have excellent processing characteristics for films, coatings, extrusions or molded products. New low prices offer you production economies. Look into the advantages you can gain from using Santicizers. For complete details, quotations and samples, mail the coupon, contact the nearest Monsanto Sales Office or write: MONSANTO CHEMICAL COMPANY, Desk H, Organic Chemicals Division, 1707 South Second Street, St. Louis 4, Missouri.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

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Dibutyl Phthalate
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(Ethyl phthalyl ethyl glycolate)
Santicizer B-16
(Butyl phthalyl butyl glycolate)
Santicizer M-17
(Methyl phthalyl ethyl glycolate)
Tricresyl Phosphate
Triphenyl Phosphate
Santicizer 140 (Cresyl diphenyl phosphate)
Santicizer 141 (an alkyl-aryl phosphate)
Santicizer 3
(N-ethyl *para* toluene sulfonamide)
Santicizer 8 (Mixture of N-ethyl *ortho* and *para* toluene sulfonamides)
Santicizer 9 (Mixture of *ortho* and *para* toluene sulfonamides)
Santicizer 1-H (N-cyclohexyl *para*-toluene sulfonamide)
Ortho-Nitrobiphenyl
Aroclors* (Chlorinated biphenyl and chlorinated polyphenyls)
HB-40 (Partially hydrogenated mixture of isomeric terphenyls)

MONSANTO CHEMICAL COMPANY
Desk H, Organic Chemicals Division
1707 South Second Street, St. Louis 4, Missouri

Please send: _____technical data; _____quotations; _____sample of _____Santicizer 141; _____Santicizer 160.

Name_____Title_____

Company_____

Street_____

City_____Zone____State_____

SERVING INDUSTRY . . . WHICH SERVES MANKIND

CLASSIFIED ADV.

(*Continued from page* 178)

FOR SALE. Will sell to highest bidder, Virgin Polyvinyl Acetate Gelva V 35 approximately 7000# packed in original drums. Reply Box C984, Modern Plastics.

FOR SALE: Approximately 6,000 pounds Nitrate sheeting from .050" to .200", in various colors. If interested contact, Granby Manufacturing Co., Limited, 81 Court St., Granby, Que. for description and price.

FOR SALE Scrap methyl methacrylate monomer, requiring distillation. For details and sample reply Box C985, Modern Plastics.

LUCITE AND PLEXIGLAS

.060 CLEAR GRADE A 20¾ x 15¾" BELOW LIST

.080 75c per sq.ft., .100 80c per sq.ft. .125 90c per sq.ft., .187 $1.10 per sq.ft. .250 $1.50 per sq.ft. No charge for cutting to size.

Lucite Cast Rod ½", ⅝", ¾" below list.

ARISTOCRAT PLASTICS INC., 55 Clarkson Street, N.Y.C. WAtkins 4-4216.

FOR SALE—700 pcs. Lucite 12" x 36" x .060" clear. First grade. Reasonable discounts from list price. Make offer. Reply Box C1011, Modern Plastics.

FOR SALE—8000 triangles 9" x 9" x 13" x .060" clear Lucite and Plexiglas. First grade, paper covered. Make offer. Reply Box C1012, Modern Plastics.

Materials Wanted

WANTED: PLASTIC Scrap or Rejects in any form. Cellulose Acetate, Butyrate, Polystyrene, Acrylic, Vinyl Resin, etc. Also wanted surplus lots of phenolic and urea molding materials. Custom grinding and magnetizing. Reply Box 318, Modern Plastics.

EXTRUDER AND MOLDER—WILL buy Polyethylene or Polythene any color—1. Virgin material. 2. Reground material. 3. Sheet stock trimmings. 4. Other. Write us formula, quantity, color and condition. Reply Box C969, Modern Plastics.

WANTED

Lucite/Plexiglas scrap. Small pieces preferred. Color unimportant. Reply Box No. C978, Modern Plastics.

POLYSTYRENE molding powder wanted. Surplus stocks—odd lots—large or small quantities. Virgin or reground in any color, clear or mottles. Send details and best price to Box C979, Modern Plastics.

UREA AND MELAMINE WANTED—We buy your odds and ends of Urea and Melamine molding compound for highest cash prices. Lots of 200 pounds and up, in factory-sealed drums only. Reply, stating age and color to Box C980, Modern Plastics.

Help Wanted

WANTED—Chemical Engineer to develop and put into production new plastic products to supplement existing line of different materials. Need broad background in compounding vinyls. Experience in calendering and extrusion essential. Location in Mid-West. Salary open. Reply Box C1009, Modern Plastics.

WORKS-MANAGER required for injection moulding factory on the Continent. Good permanent prospects for the right man. Write full particulars of experience and salary required to R.Z.M., c/o Nijgh & Van Ditmar, Rotterdam (Holland).

EXECUTIVE — Modern, well-established plant, molded plastics, in northern New Jersey, wants top executive; unusual opportunity for right man. Engineer with at least 10 years experience in modern production methods. Brief resume and references for interview. Reply Box C986, Modern Plastics.

CHEMIST—Experienced in Polymerization of Styrene Monomer to manufacture of injection compound in all its phases. This is a very good opportunity for the right man with a reliable eastern firm. Your letters will be kept in the strictest confidence. Reply Box C987, Modern Plastics.

SALESMAN. To sell Vinyl sheets to fabricators. Must be experienced and come well recommended. To the proper person, this is an opportunity of a life time. All replies will be kept confidentially. Reply Box C988, Modern Plastics.

SALES ENGINEER WANTED

Established custom injection and extrusion molding plant in Chicago desirous of obtaining sales representation in industrial areas of the United States. Prefer experienced plastic man or salesman with contacts and engineering background. Excellent factory cooperation. Complete tool room, engineering and designing; also assembly, painting and finishing. Superior Plastics Division Commonwealth Plastics Inc., 414-430 North Oakley Boulevard, Chicago 12, Ill.

PLASTICS ENGINEER

Specialized in plastic extrusion in general, in vinyl and polyethylene in particular. Must be progressive, experienced, capable running plant and taking full charge research, experimenting. Prefer person who could buy proportionate interest in Company. Excellent opportunity for right person. Write full details. All information kept confidential. Reply Box C989, Modern Plastics.

WANTED: PRODUCTION ENGINEER to take charge of Extrusion Dept. of small mfr. wire, cable, shapes, sheet matl. Midwest. Mechanical ability and familiarity with die design essential. M. E. preferred. Reply Box C1010, Modern Plastics.

EXTRUSION POSITION OPEN

Top job for top extrusion EXPERT. Must be specialist in extrusion and die design as well as having complete knowledge of formulations for compounding and coloring such materials as vinyl, acetate, ethyl cellulose, and polystyrene. Reply Box C1013 Modern Plastics.

Situations Wanted

PLASTICS ENGINEER, DESIGNER—For a firm that wants to meet the pinch with new ideas and new items. Background in mold and product design on new items and processes. Interested in a chance to locate in the New York area in a responsible challenging position. Reply Box C993, Modern Plastics.

POSITION DESIRED BY YOUNG MAN with 10 years experience as General and Production Manager. Experienced cost, fabrication and molding; tools, dies and mold design and construction; Shop problems. College, engineering and practical experience background. Knowledge of sales and contacts. References. Would like to locate in the south or east coast area. Presently employed, available in 30 days. Reply Box C991, Modern Plastics.

INJECTION MOLDERS—If your plant is busy but does not make the profits you expected, or, if you lose jobs because you cannot figure low enough to meet competition's prices, you need a *1-A-Works-Manager*, able to engineer and estimate jobs the right way, design the most efficient and modern molds, get the best cycles out of your presses, methodize your finishing, rate molding and finishing costs by time-study on an incentive base, schedule in time production and inspection, and check costs all along the line. I am this man: Engineer, college graduate, 12 yrs. injection molding from bottom to managerial positions, business-minded, hard worker, strong organizer, pleasant personality, no armchair-executive, actually employed in similar top-position. Midwest preferred, but no objection to New York or West Coast.—Reply Box C990, Modern Plastics.

CHEMICAL ENGINEER—Young, with exceptional background and experience in colorimetry, coloring, compounding, extrusion and injection molding of thermoplastics. Reply Box C992, Modern Plastics.

AVAILABLE—B.Ch.E. Chemical Engineering graduate Polytechnic Institute of Brooklyn June 1949, Plastic and Resin Technology major, age 21—single, desires position as a trainee in sales, development or production; will locate anywhere in the U.S.A. Resume on request. Reply Box C994, Modern Plastics.

PLASTIC APPLICATIONS — Consulting chemist, PhD equivalent, located in midwest, available on part time basis, for specialty problems in formulation and application of plastic adhesives, coatings, and impregnants for metal, paper, wood, textiles, plastics, etc. Product development and engineering service. Reply Box C996, Modern Plastics.

PLASTIC ENGINEER AVAILABLE—Ten years experience in injection, compression, extrusion, and transfer molding. Tool design, product design, sales service, and production. Wide experience in the development field. Considerable experience in testing plastic materials—physical and chemical testing. Can design and create. Capable of managing a plastic plant. Desires position in Midwest. College graduate, Chemical Engineer. Reply Box C998, Modern Plastics.

AVAILABLE—Married man, age 29, who is not a clock watcher and will render a lot of service. Technical training in all fields of plastics. Prefer position with Molder, Fabricator or Laminator. Will attend any training course in organizational set-up. Knowledge of design, drafting, sales, woodwork and machines. Two years in fabricating. Will sacrifice salary for experience. Reply Box C997, Modern Plastics.

PLANT MANAGER AVAILABLE — Also plant and process design development. Twelve years experience. Background in compounding of vinyl for extrusion, calendering, phonograph records, wire coating, etc. Production and research vinyl floor covering. Wide background cellulose acetate and other thermoplastic. Thorough knowledge polystyrene polymerization. Capable of installing and operating modern extrusion compounding process. Thorough and practical knowledge of techniques and business of plastic industry. Location immaterial. Reply Box C995 Modern Plastics.

(*Continued on page* 182)

"PLASTICS are *Right* if they're *Molded* by *Northern*"

This is no idle slogan, or catch-phrase headline. It stands for a reputation honestly earned. A reputation gained through 40 years of molding experience which has given *Northern* designing, engineering and molding personnel a knowledge of *what* compounds to use, *how* and *when* to use them, and the best way to mold *each* one.

The *Lenk Manufacturing Company* capitalized on this highly diversified experience by choosing *Northern* to mold the gun-grip of this unique soldering iron. Phenolic plastic was used. Northern stands ready to prove to you — "Plastics are Right if they're Molded by Northern".

Northern **INDUSTRIAL CHEMICAL CO.**

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WITHOUT SHOCK!

It often happens that when we tell plastics plant executives about the remarkable valve shown at the right, the

ATLAS Type "E"
High Pressure Reducing Valve

they are inclined to be skeptical when we say that the valve will *easily* reduce pressures as high as 6,000 lb. per sq. in. — WITHOUT SHOCK. This is particularly true of operators who have had trouble reducing high pressures. They think it "can't be done". Yet, here is a valve that DOES it, regardless of whether it is water, oil, or air.

"Wonderful", you say?

Yes, in a way it *is* wonderful. But when you remember that ATLAS has been in the regulating valve business *exclusively* for over a half century, superior performance can be expected. Thus for example the body of Type "E" is made entirely of the strongest forged steel. All of the internal metal parts are of hard chromium plated stainless steel. A formed packing of special material superior to leather is used which is immune to all fluids commonly used in hydraulic machinery. The pressure on the seat is balanced by a piston with the result that variations in high initial pressure have little effect on the reduced pressure. Ask for complete data.

For other ATLAS plastic plants products see the partial list in our ad in the January 1949 issue of MODERN PLASTICS

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REGULATING VALVES FOR EVERY SERVICE

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Plastics I.Q.

Can you take a **BETTER** *job in plastics*

If you really want to go ahead fast in the growing field of plastics, there is one logical, direct way—*learn more about it.* Qualify yourself through training AT HOME IN YOUR SPARE TIME— by one of the industry's most respected schools.

Show your employer that you intend to *go places in plastics.*

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DEPARTMENT OF WEST COAST UNIVERSITY

CLASSIFIED ADVERTISING

(Continued from page 180)

Miscellaneous

FOR SALE: Complete Molding plant—8 machines, 3 oz. to 48 oz. capacity. Complete Tool Room with Duplicator, Pantograph and Hobbing Press. Reply Box C1005 Modern Plastics.

BUSINESS FOR SALE—Moldmaking shop. Completely equipped and including injection molding machine. Present volume approx. $100,000. Newark area. Sale includes name, real estate, and backlog etc. Particulars will be furnished on request. Reply Box C1006 Modern Plastics.

WANTED—Comb molds, large amount of cavities for pocket comb, purse comb, rattail comb, men's comb and ladies' dressing comb. Reply Box C1003 Modern Plastics.

REPRESENTATIVES WANTED

Old established midwestern compression and injection molder operating modern efficient low cost production plant with fine reputation, are interested in securing sales representatives in several territories east of Mississippi.

This progressive molder requires only highest type ability and men capable of producing business with profitable long-time connection. Immediate connections can be made and confidences will be exchanged. Address replies with full information to Box C1001, Modern Plastics.

FOR SALE! Several injection molds, perfect condition, making 10c to 25c toy items, that are exclusive and original. Samples and mold costs will be submitted, upon inquiry. Foreign Country Inquiries Invited. Reply Box C1004 Modern Plastics.

MANUFACTURERS REPRESENTATIVES WANTED—Midwestern molder featuring ultra-modern molding equipment for thermosetting materials desires additional sales representatives; commission basis; specialty housewares handles and hardware, etc. Reply Box C1002, Modern Plastics.

LIST YOUR USED Plastic Equipment with us. We Have Buyers. Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WANTED—Stokes Model #235, 50-Ton Automatic Molding Presses. Write, giving condition of machine, serial number and price. Reply Box C1000 Modern Plastics.

LINES WANTED

Sales representative, New York specializing in 5¢ to $1.00 items suitable for big Chain Stores, desires to contact manufacturers of plastic specialties, housewares, toys, notions, stationery or novelties. I have over 20 years experience, an extensive following and can market your products in volume. Commission basis. Reply Box C867 Modern Plastics.

MANUFACTURERS ATTENTION — Sales engineer calling on compression, injection, extruder and rubber wire manufacturers in New York area, Connecticut, Rhode Island. Desires additional lines. Highest references. Reply Box C973 Modern Plastics.

PATENT RIGHTS for sale or License. Patent, 2,415,209, GROMMET SPINDLE. Pat. Feb. 4th 1947. A moulded, all-plastic, grommet spindle for use in manually producing cotton string grommets which are essentials in ship building and repairing. Figures embossed on the ends of the spindles indicate the diameter of the spindle. Accurate measurements; flexible molding at low cost; international markets. Write, Morten B. Michelsen, Antonito, RFD 164, Colorado. (Group 37-31-32-30-81. Register No. 8,195.)

IF YOU HAVE GOOD HYDRAULIC PRESSES with modern pumping equipment for sale send me your specifications of same with photo, and I will see to it that you will get the best price available. Announcing: Hydraulic Sal-Press Co., Inc., formerly Sal's Press, located at 386-390 Warren St., Brooklyn, N. Y. Will continue to render its usual good service.

re Mrs. Elizabeth Keller, deceased. Information is sought as to present whereabouts of Victor August Keller (Son of Mrs. Elizabeth Keller, who died at Margate, England on the 2nd December, 1939), who left England for the United States in 1939, and who is believed to be an expert on "Plastics". Replies to Girling, Wilson & Bailey, Solicitors, Margate, Kent, England.

ESTABLISHED PLASTIC INJECTION MOLDER presently in Builder's Specialities field, interested in arranging a connection with a party to develop and sell proprietary products to Chain and Department Stores. 8 to 32 ounce capacity with own tool facilities. Consideration only to be given to experienced and well established parties in merchandise field. Reply Box C999 Modern Plastics.

WANTED—Large molding corporation willing to rent minimum of 26 weeks, a 6 or 8 oz. injection machine. Will pay $100.00 a week, and move machine to own plant; will guarantee its maintenance. Write Box 0, Malvern, Pa.

$13\frac{3}{8}$ x $23\frac{1}{2}$ MOLD BASE

Now

Standard DME Size

Again DME takes another step forward—adds to its line of standard mold bases a new size—13⅜ x 23½— to meet present day needs. This new size utilizes the greatest area of platen surface on most presses. Brings you further efficiency and economy.

Available in "S" and stripper plate series as well as the standard A-series shown above. Send for complete data sheet M.

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The Green Engraver offers great speed and convenience. Quickly cuts up to four lines of letters from 3/64" to 1" on curved or flat surfaces whether made of metal, plastics or wood . . . operates by merely tracing master copy — *anyone* can do an expert job. Special attachments and engineering service available for production work. Just the thing for radio, electronic apparatus and instrument manufacturers. Write today for Bulletin MP8.

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PROPERTIES

Formula	$C(CH_2OH)_4$
Composition	approximately 90% pentaerythritol, and 10% dipentaerythritol
Appearance	white powder
Melting Range	185°-230°C.
Hydroxyl Content	47.5%
Combining Weight	35.8
Water	0.3%
Ash	0.06%
Specific Gravity 25°/4°C.	1.38
Bulk Density	0.7 (44 lbs./cu.ft.)

Solubility (g. per 100 g. solvent)	
Water at 25°C.	8
Water at 100°C.	90
Ethanol at 25°C.	0.5
Benzene at 25°C.	insoluble
Acetone at 25°C.	insoluble
Oils at 25°C.	insoluble
Glycerol at 100°C.	approx. 10
Pyridine at 100°C.	approx. 5

General

Non-hygroscopic; non-toxic; all hydroxyl groups esterifiable

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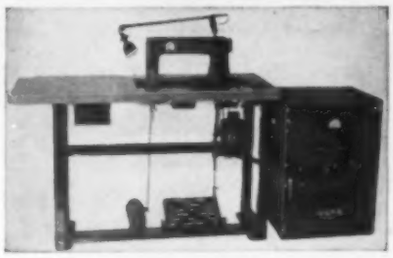

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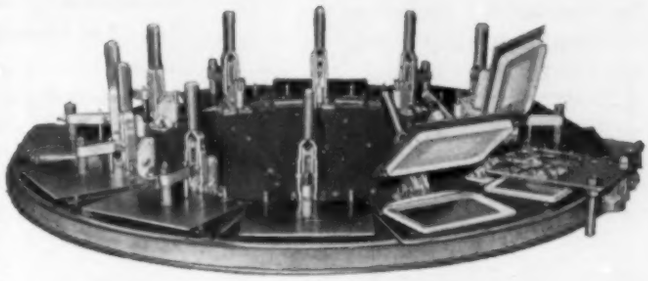
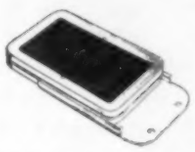
The Merry-Go-Round that Never Broke Down...





No, *this* "Merry-go-round" never broke down, but it *does break* production bottlenecks every day, thanks to versatile De-Sta-Co Toggle Clamps!

It's a high-production assembly fixture for a new plastic product, the "Wheel" Ink Plate, designed by Nichols-Detroit, to replace the old-fashioned inking pads used with rubber stamps. The plastic bottom of the Ink Plate also serves as a reservoir. Ink feeds by capillary action to the upper side of a porous metal plate, where it is ready for use. Through an ingenious design, the flow of ink is rigidly controlled to insure correct distribution over the surface of the plate, providing perfect reproduction at all times, with complete safety in any position.

Here, the bottom of the case is being bonded to the body. They are clamped rigidly in position; action of the clamp also actuates flow of solvent to the mating surfaces of the two plastic pieces at another station, after which they are bonded. Requirements: fast bonding cycle . . . positive clamping pressure for a perfect bond . . . precise alignment of work pieces for accurate assembly. Rapid toggle action, sure holding pressure, rugged durability and well-engineered design make De-Sta-Co No. 207U Toggle Clamps the tool designer's logical choice for this application.

And they're the logical choice, too, for holding parts during
● Assembly ● Welding ● Riveting ● Machining of plastics, metal and other materials. Whatever *your* work-holding problem, there's a De-Sta-Co Toggle Clamp that's a "natural" to solve it. The complete line of more than 40 stationary and portable De-Sta-Co Toggle Clamps is shown in Clamp Catalog No. 49. Send for *your* copy today, and the name of our stocking representative nearest you.

DETROIT STAMPING CO.

327 Midland Ave., Detroit 3, Mich.

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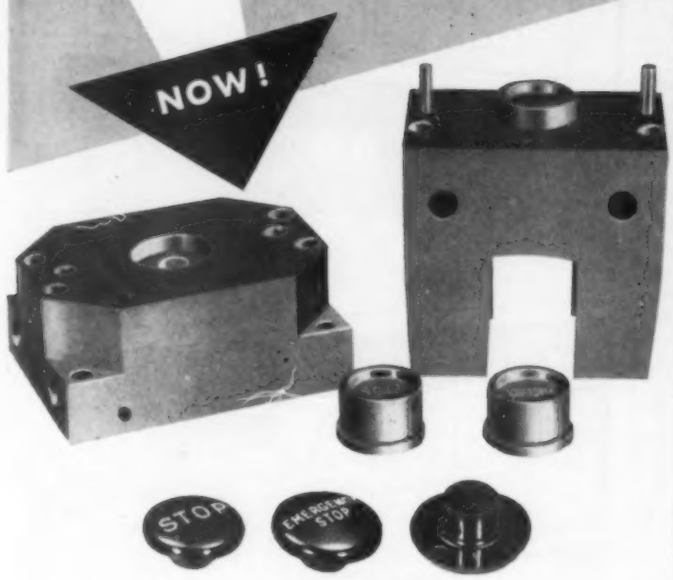

$7/16$" deep cavities made by Florence Tool & Die Co. from Carpenter *Mirromold* hobbed on a 210-ton press in a single push. No side or back relief on 3" dia. blanks. All hand tool work was eliminated. Push buttons molded by Pro-Phy-Lac-Tic Brush Co. for Federal Electric Products Co. $3/16$" deep lettering perfect in size, free from distortion!

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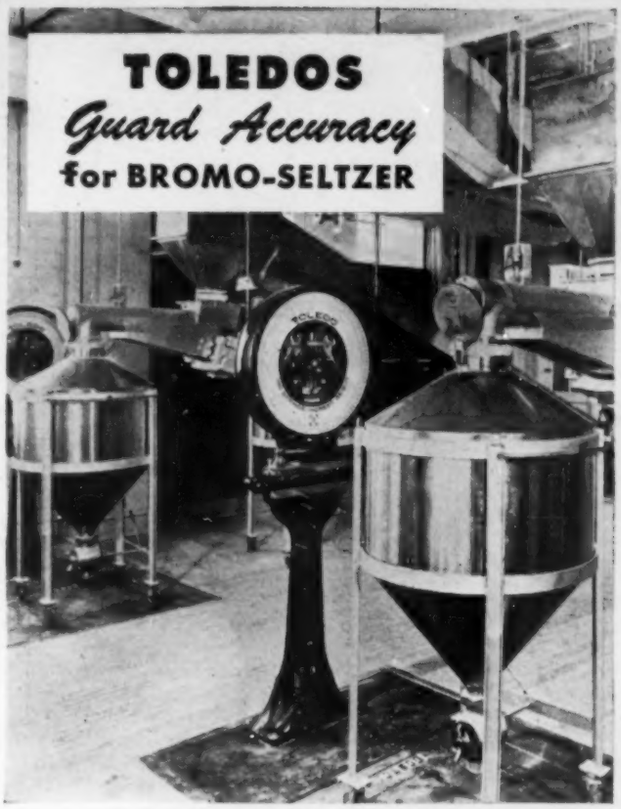

Accurate batching . . . automatically controlled by Toledo Scales . . . helps to maintain unvarying quality in production of Bromo-Seltzer at the Emerson Drug Company, Baltimore, Md.

Shown here is part of the efficient production system of this plant. The dry, granular processed salt is fed to the bins by a belt operating in a stainless steel housing. The material is weighed into the portable hoppers shown on the scale platforms . . . with Toledo automatic controls cutting off the filling operation at precisely the desired weight.

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This message deals with "BAKELITE" PHENOLIC MOLDING MATERIALS

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These materials have widest utility, providing many desirable properties, preformability, ease of molding, and all-round serviceability at lowest cost. They come in blacks, browns, mottles, and made-to-order colors.

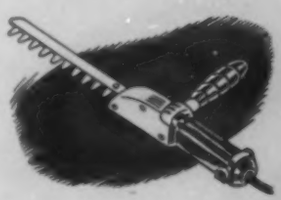
Typical uses: radio and television cabinets, bottle caps, wiring devices, automobile distributors.

2. IMPROVED IMPACT-RESISTANT PHENOLICS

These materials provide the excellent appearance of the general-purpose phenolics, and up to twice their resistance to mechanical shock. They are readily preformed, but may require special feeding devices on machines.

Typical uses: washing machine agitators, instrument cases, meter housings.

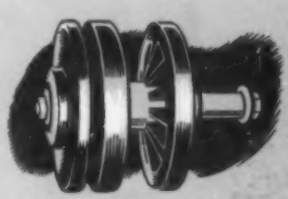
3. PREFORMABLE IMPACT-RESISTANT PHENOLICS



These materials are similar to the improved impact-resistant phenolics in properties and characteristics, but offer in addition preformability approaching that of the general-purpose materials.

Typical uses: heavy duty housings and bases.

4. MEDIUM IMPACT RESISTANT PHENOLICS



These materials provide four to six times greater resistance to mechanical shock than the general-purpose phenolics. They cannot be preformed on automatic equipment, but can be preformed by hand.

Typical uses: pulleys, machine tool handles, parts for oil-well drilling apparatus.

5. HIGH IMPACT-RESISTANT PHENOLICS

These materials provide eight to sixteen times greater resistance to mechanical shock than the general-purpose phenolics. They are preformable only by hand.

Typical uses: heavy-duty flashlight housings, instrument housings, industrial truck wheels.

6. HEAT-RESISTANT PHENOLICS

These materials were developed primarily for service at elevated temperatures ranging from 350 deg. F. to 400 deg. F. They are the most dimensionally stable of all the phenolics.

Typical uses: cooking utensil handles and knobs, toaster and waffle iron parts.

7. SHOCK- AND HEAT-RESISTANT PHENOLICS

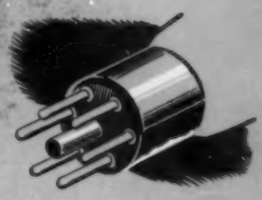
These materials provide up to two and a half times the impact strength of the general-purpose phenolics, along with high heat resistance. Parts molded from these materials will withstand exposure to temperatures up to 400 deg. F.

Typical uses: commutator insulation, railway equipment parts.

8. "LOW-LOSS" INSULATING PHENOLICS

These materials have outstanding electrical insulating properties, notably low power factor, high dielectric strength, and high volume resistivity, in addition to low water absorption and dimensional stability.

Typical uses: coil forms, tube bases, capacitor casings, ignition parts.



9. CHEMICAL-RESISTANT PHENOLICS

Materials in this group, depending upon their varied formulations, have good resistance to water, acids, alkalies, alcohols, oils, greases, and other chemical products. Another desirable characteristic common to this group is minimum odor.

Typical uses: storage battery caps, sterilizers, milking equipment parts.

10. X-RAY SHIELDING PHENOLICS

These materials were developed primarily for x-ray equipment parts. A molded thickness of 5/16 in. is equivalent in shielding effect to 1 mm. thickness of lead.

Typical uses: x-ray equipment parts such as tube shields.

Additional detailed data is available on the various types and grades of BAKELITE Phenolic Molding Plastics. Write Department N-13 or call upon Bakelite Corporation technical representatives who are located in major industrial centers throughout the country.

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Paper cup dispenser, molded by General Electric for the Dixie Cup Company, Easton, Pa.

LOWER SELLING PRICE! The use of G-E plastics (instead of wood) for this television cabinet helps to make possible a low-priced set.

LARGE-VOLUME JOBS! G. E. is ideally equipped to mold large-quantity jobs—like parts for the Ocean City Manufacturing Co.'s surf casting reel.

PLASTICS FOR DISPLAY! The attractive housing of this Spur syrup dispenser was molded by G. E. for Canada Dry.

Plastics

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Here's an excellent example of how General Electric's plastics molding service helped to achieve improved design and *low costs* on a large-volume job.

G. E.'s customer, the Dixie Cup Company, wanted an attractive cup holder—sanitary, durable, yet inexpensive enough to be sold for home as well as office use. They got it! General Electric molded this cleverly-designed unit of crystal-clear polystyrene; no metal dispensing parts are needed. And low-cost production made possible a low retail price which is attracting thousands of customers.

For low cost and high quality depend on General Electric's plastics service! One of the world's largest plastics molders, G. E. is ideally equipped for large-volume production. WRITE US FOR MORE INFORMATION on how this service can work for you. Or contact your nearest G-E sales office. Address: Plastics Division, Chemical Department, General Electric Company, 1 Plastics Avenue, Pittsfield, Mass.

GENERAL ELECTRIC

CD49-A44

General Electric plastics factories are located in Coshocton, Ohio; Decatur, Ill.; Taunton and Pittsfield, Mass.

MODERN PLASTICS

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122 EAST 42nd STREET

NEW YORK 17, N. Y.

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